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PENCIL POINTS
PROGRESSIVE ARCHITECTURE

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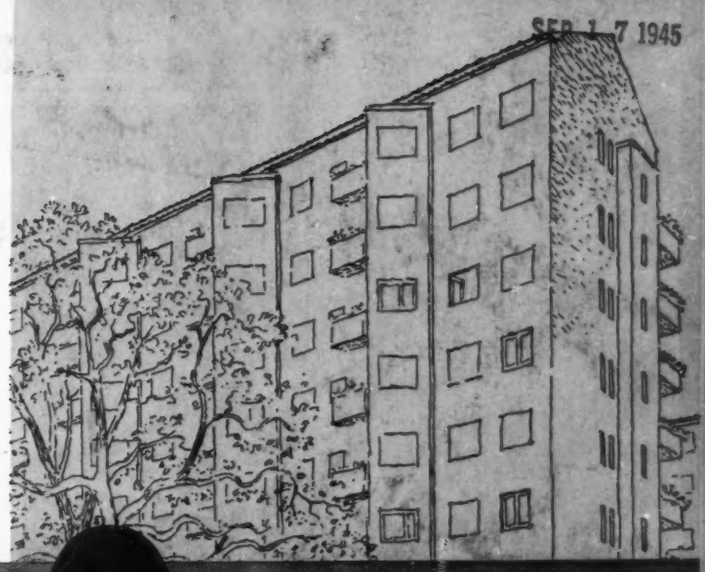

9

September 1945

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ADDRESS_____

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Pencil Points

PROGRESSIVE ARCHITECTURE

September, 1945

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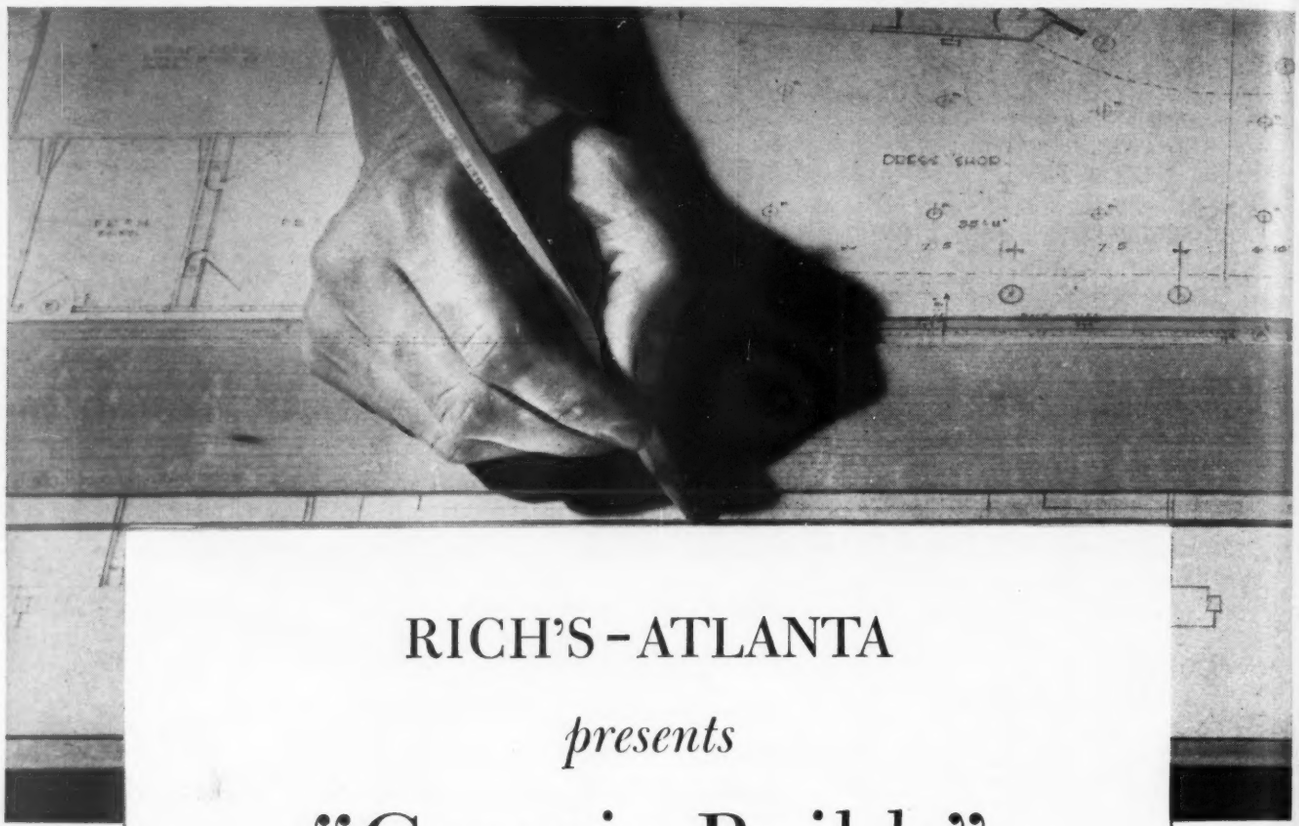

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The Official Program of the Pencil Points – Rich's, Inc. Architectural Competition will be published in the October 1945 Issue of Pencil Points

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BRUCE

America's Beauty Floors

BRUCE FINISHED FLOORS

Views

Opinions from readers

Remarks from the editors

Changes of address

Bring the Family

Dear Editor:

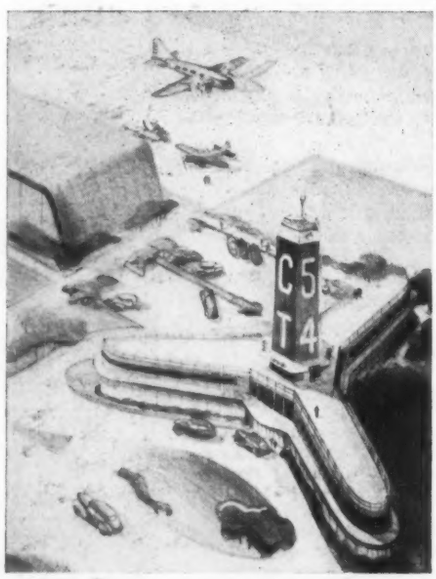
I just received a copy of the July 7 issue of PENCIL POINTS carrying the very interesting articles on Transportation. I particularly want to commend your Editorial Department on the complete presentation of Evansville Memorial Airport and Recreation Center. I have carefully read your article and the drawings of the architect we selected, Albert Kahn; you have presented a very interesting and complete story of the program we outlined for our proposed airport.

We have always been of the opinion that in order to stimulate a greater interest in aviation, other facilities are necessary at the airport in addition to the administration building and hangars. When you provide these facilities you then are able to bring the entire family to the airport for a pleasant afternoon or evening and before long the atmosphere of aviation permeates to others who might only be mildly interested in aviation.

It is our understanding from the Civil Aeronautics Authority that this is the first project of this nature submitted by any Airport Board in the United States and the first one in which complete detail drawings have been prepared for postwar construction. There is no question but that if we provide wholesome and good places of entertainment and recreation for youth, our delinquency will drop. Delinquency has not only been a most alarming problem during the war period but will become a greater one in the postwar years, as 50 percent of the crimes committed in our country are by boys and girls 15 years of age and younger.

Again we want to compliment you on the forward steps that your magazine is taking in presenting building construction an problems pertinent to the development of this country now and in the postwar period. This can only be done through constructive and worthwhile articles on practical construction. So many of these projects contemplated are marihuana thinking which may not be realized for ten to fifteen years. We have approached our problem at the Evansville Airport along practical lines which we feel are also adapted to many communities of equal or greater population throughout this nation.

WALTER G. KOCH, Chairman
Board of Aviation Commissioners
Evansville, Indiana



Code Location Markers, as proposed by Dr. L. L. Zimmer, Rockville Centre, L. I., embody a maximum of visibility and simplicity for the air traveler. Containing no more than four digits designating points of the compass and latitude and longitude, the code can be used universally without repetition. Incidentally, the super-service station upon which the code marker is shown here, contains modern hotel facilities. It was designed by Raoul L. Dubrul.

Designers and Stylists

Dear Editor:

It is seldom that I disagree with anything in your editorials, but I would like to comment on your "Two Kinds of Architecture." For a number of years I have maintained a close contact with the problems of small house building and feel that my experience justifies some comment on your editorial, even though my practice is general.

The statistical conclusions seem to me inconclusive and possibly misleading. During the past few years most housing actually built has been either direct war housing, under the auspices of the Army and other agencies, or groups of houses under Title 6 of the FHA. In both cases I believe that the greater part have been handled by professional architects. The large volume of housing expected after the war, in my opinion, will be in the hands of operators, building from 20 to 200 or more houses in each project. As I see it, the small builder who handled one or two houses at a time or from six to ten during a year, will not have control of a very large volume of postwar building.

Most of all I disagree with your phrase "degenerating into speculative operations." I can think of no good reason for assuming that houses built speculatively must of necessity be poorly planned or that there is any possibility or desirability of eliminating the speculator. The speculator does exactly what the manufacturer of automobiles, refrigerators, or any other article not made to order, does. He produces something for which there is a market, in a form, and at a price he believes will sell; if he has misinterpreted the market he will go bankrupt. The economies of mass production are in the assembly line as well as in power tools. Mass production of parts of houses correspond to the feeder manufacturers of the automobile industry, but the assembly line must be on the building site, and this economy can only be achieved by the operator who builds in volume.

If architecture is to remain a profession with its chief contribution in the field of creative design, architects will serve better in a capacity corresponding to independent industrial designers and stylists, rather than as producers of manufactured goods. The functions of design and production require quite different abilities and attitudes of mind.

Architects, I believe, can furnish two distinct services in the home building field and retain their full professional status. In the first place we can serve the large operator whose projects will often involve site planning, community centers, and shopping districts, which no one will deny are very definitely in the field of architecture. The second function is in the designing of occasional single small houses for individual owners, which may not ever involve any large volume but are of great value in setting standards of planning and design which can have a wide influence. The architectural fees for such individual houses may not and cannot be on a competitive basis. They are luxury designs comparable to the work of a few individual designers of women's clothes whose influence indirectly affects a whole industry. Many of these individual houses will only please the client for whom they are built, a few of them, by process of natural selection, will have a wide and permanent influence. Personally I can see no reason for any change in the code of practice, and I am convinced that a much larger volume of house building will be in the hands of architects after the war, than ever before. They won't be "dream homes," but they will become progressively better.

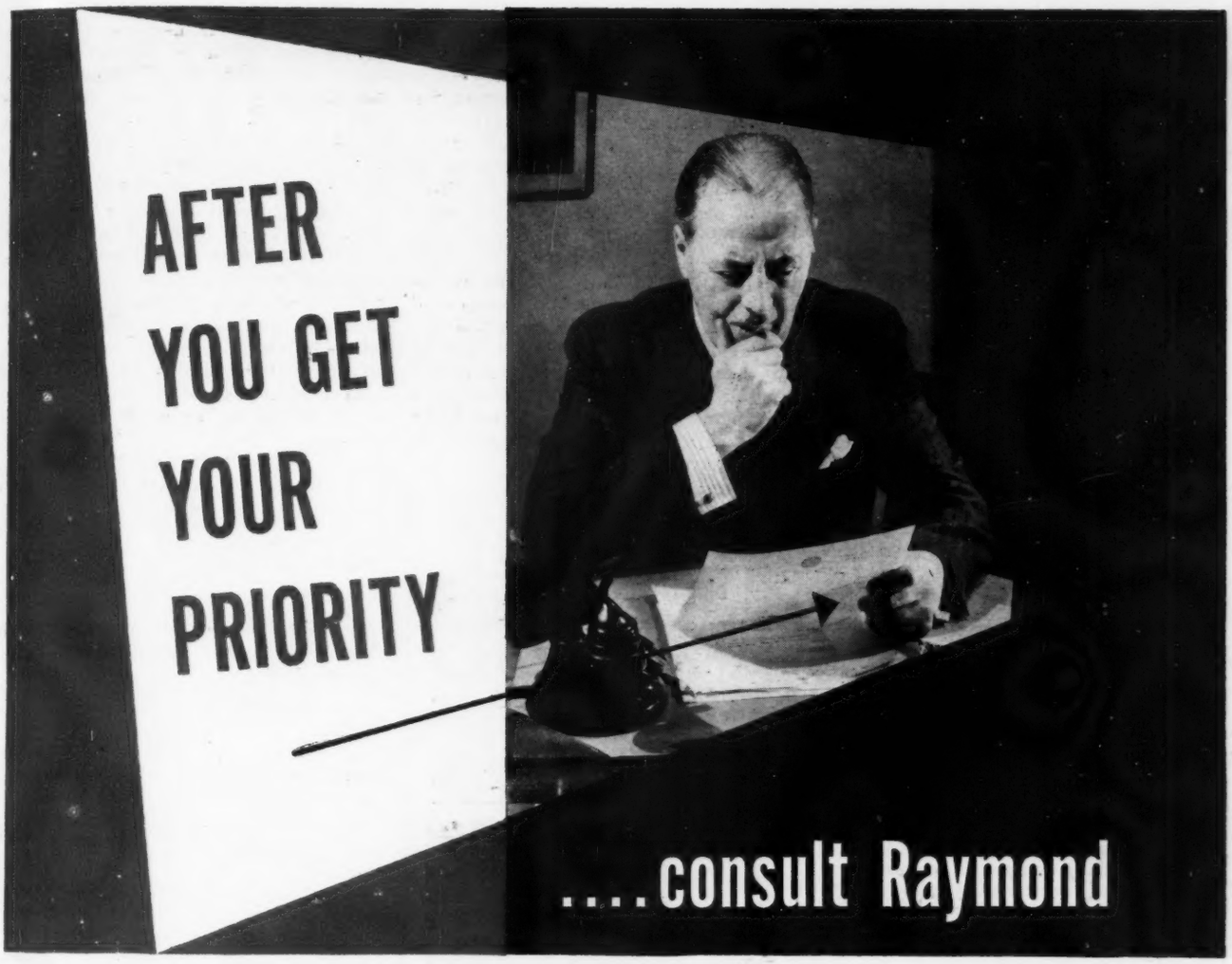
HARRISON GILL
Chattanooga, Tenn.

Any Like-minded?

Dear Editor:

It is my feeling that present day designing and planning professions, if they are to keep abreast of our modern industrial development and contribute

(Continued on page 10)



AS SOON as you have Uncle Sam's "green light" to go ahead with new projects, let's get together and talk over your foundation problems. Throughout the past four decades the Raymond organization has successfully completed over 11,000 safe foundations . . . large and small . . . in many parts of the world. During the past few years Raymond has been solely engaged in filling **essential** wartime contracts The experience and technical knowledge gained in these government projects, combined with the research improvements and test methods developed, provide more efficient performance than ever before in (1) the investigation of underground conditions (2) interpreting the results (3) determining the best suited foundation and (4) installing these foundations. Raymond's accumulated knowledge, experience and ability are ready to serve you again. Your inquiries will receive prompt attention.

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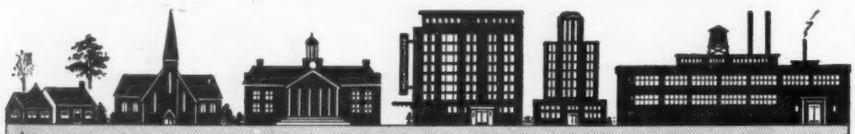
Views

(Continued from page 8)

anything like their fair share to its economic and social development, must think in terms of offering something like an all-inclusive and well-integrated service. For some time we have already seen architects hiring mechanical engineers, landscape architects, etc., and city planners hiring civil engineers, economists, etc., and building contractors hiring the whole kit and kaboodle. There is, of course, no question as to who wields financially the greatest hiring power. Yet I am convinced that it will be to the distinct advantage of the individual professional and of the society which he serves, if the bulk of the professions maintain that independent status which alone can assure the freedom of expression so essential to vital designing and planning. And if the nature of our complex industrial society is getting to be such that the fellow who can offer the broadest background and most complete service is the one who is going to be most likely to get the job, then I say, let the professions get together and offer their services in a coordinated fashion. This is no doubt another instance of "hang together or hang separately."

The many thoughtful hours that I recently spent while in the service of the U. S. Army served to sharpen my perspective along this line and I hope to be able to work out something in that direction myself, when I get back to Chicago next Spring. More recently I've been doing some studying, holding the Chandler Fellowship in City Planning at M.I.T. When that's finished, I look forward to getting together with a few other like-minded individuals so as to develop a well-rounded analyzing, planning, and designing practice in the Middle West. Incidentally, who the others shall be is still an open matter and I would certainly welcome correspondence on the subject from interested persons.

ARTHUR BASSIN, R. A.
Boston, Massachusetts



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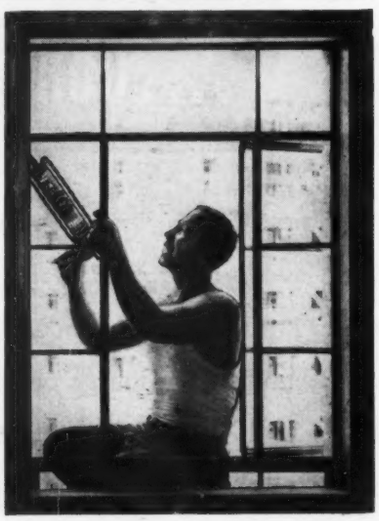

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Not Often Found

Dear Editor:

Miss Nelva Weber's "Landscape Design Data" in your June issue was most interesting.

In the General Civil Engineering office information on the handling and planting of trees and shrubs is of value, but sources of easily consulted material are not often found.

Any future contributions by Miss Weber will be added to our files.

RICHARD G. COULTER
Syracuse, N. Y.

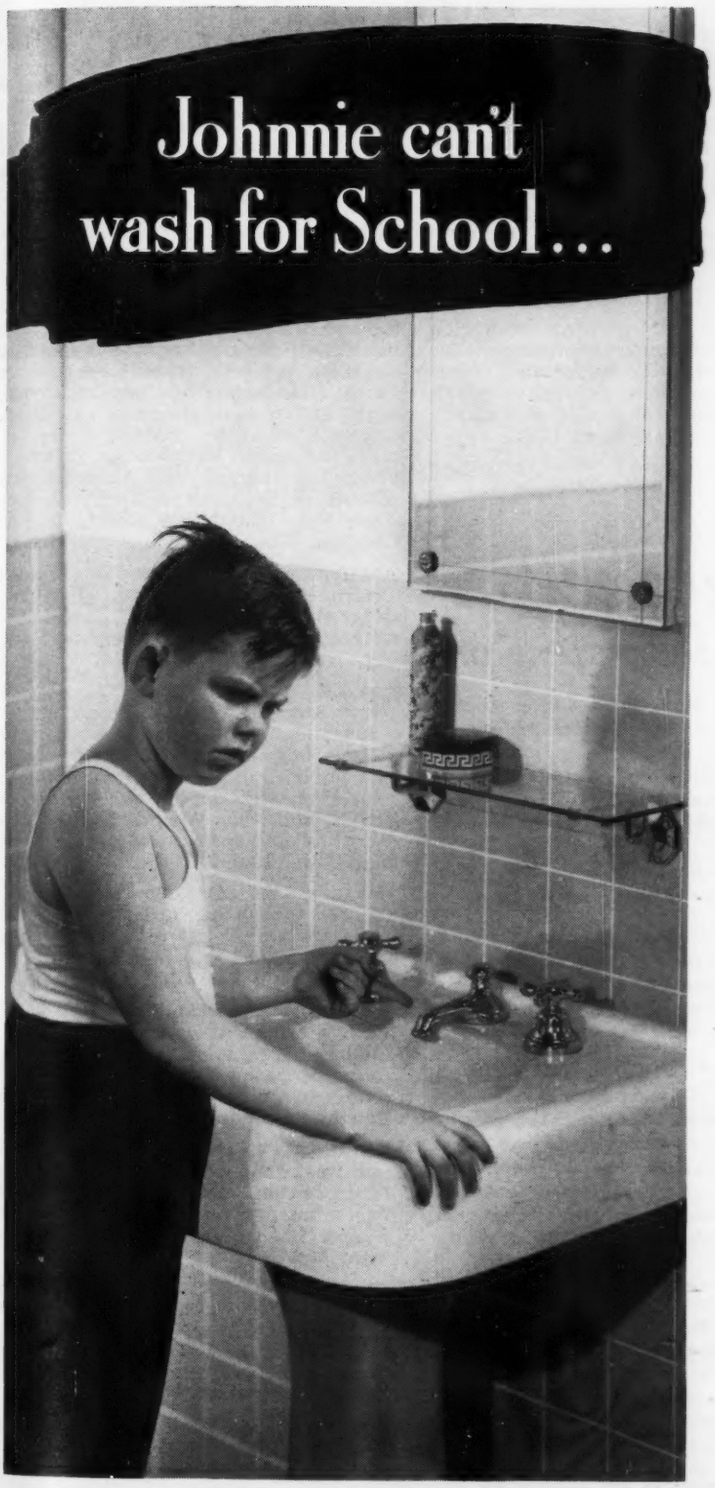
THEY SAID AND WE QUOTE

. . . get into the city and see the Modern Museum's exhibition, "Tomorrow's Small House." Those who incline to the thought that the house, as something to live in, reached its acme of perfection in the smug little clapboard rabbit warrens euphemistically called "colonial" are in for a shock. But the shock is something that should be endured. And it is almost certain that, if he survives, the witness will emerge a stronger man. Architecturally these houses . . . are like a breath of sweet fresh air. No more dungeons of basements or stuffy attics or stupid dormer windows. No more bedrooms with partial headroom. No more phoney fronts and porches with spinning-wheels. No more ponderous fake construction. Just spatial, livable cubage with lots of light and air. If this is the trend, why should anyone want to oppose it?

Percy Cashmore
The Blueprint
Westchester Chapter, A.I.A.

Housing should occupy a prominent spot in this broad challenge of the America of tomorrow. There is no element in our national life which is closer to the welfare of the American people or more significant as a potential outlet for jobs, production and investments.

John B. Blandford, Jr.
Administrator, NHA



INSTALL STEEL PIPING
ADEQUATE FOR TOMORROW'S NEEDS

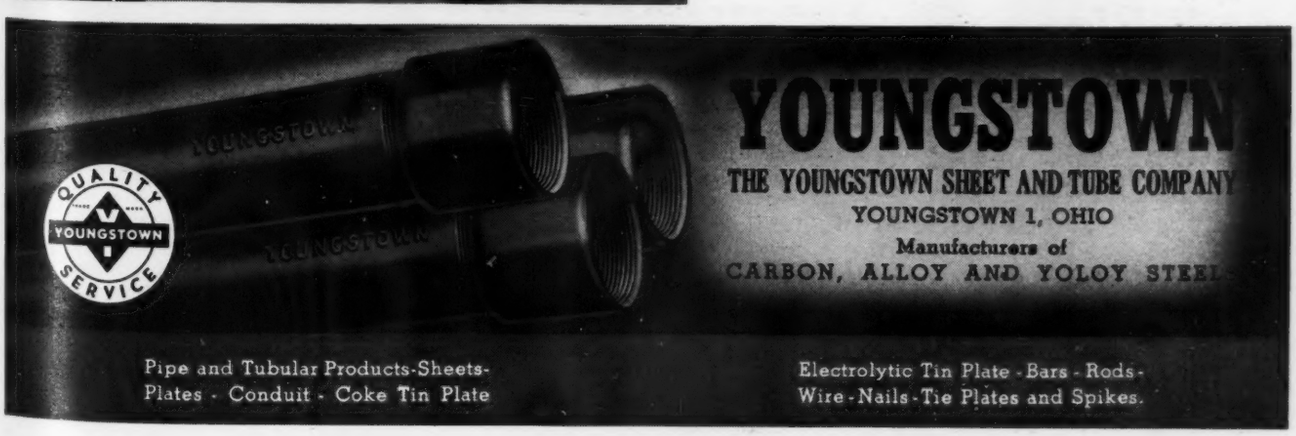
Because Mom's doing the Laundry!

THIS little domestic dilemma is all too familiar to many an American home. The second floor faucets dribble because the basement laundry tubs are in use.

Maybe the water pipes did look big enough to the builder when the house was built years ago. But now there are too many outlets, too many fixtures, too many needs for water.

For new homes to be built or old homes to be modernized in the post war period, you can contribute to better, more comfortable living by providing an adequate supply of water. That requires larger steel pipe--pipe the experts a few years ago might have called "oversize." Watch especially that run from the street main to the house, and the meter size to provide for future additional fixtures.

Always remember this: No more water can be delivered than pipes can carry under existing city pressures. The best way to insure an adequate water supply is to use steel pipe of an adequate size. The additional cost to install steel pipe of adequate size is very small.



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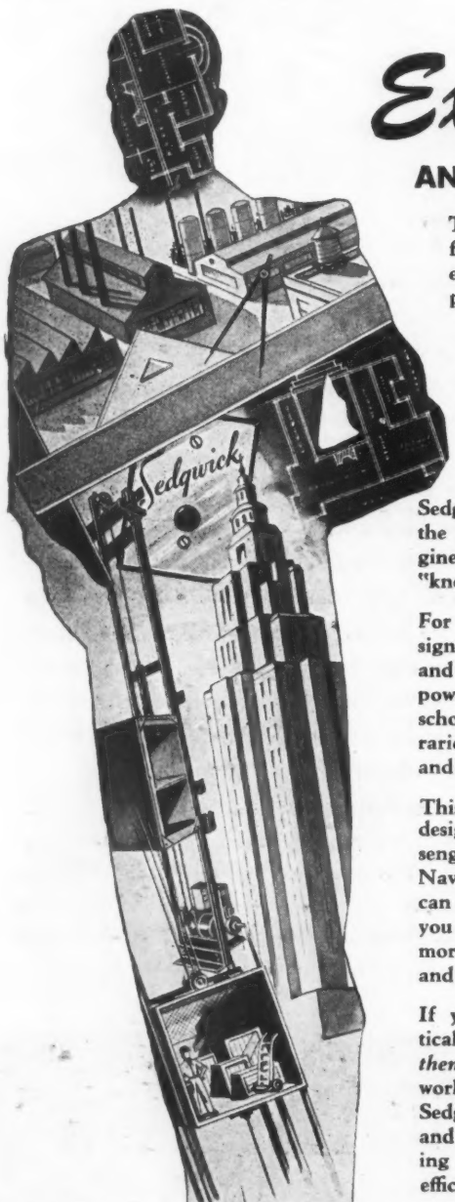

Experience...

ANOTHER LEG TO STAND ON

Two of the most perplexing problems facing architects and engineers making elevator and dumb waiter plans for postwar buildings are—first, *"what can I do to keep my clients' costs down despite the high cost of labor and materials?"* And second, *"how can I plan to maintain high operating efficiency while reducing costs?"*

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ARCHITECT-DESIGNER wanted. Must be top-notch with successful background in MODERN design. Capable of handling complete projects from conception to finish. Rendering and styling important. Ability to meet clients and handle accounts desirable. Excellent and permanent future. High salary. Write or visit office nearest you. J. Gordon Lippincott & Co., 500 Fifth Ave., New York City. 230 North Michigan Ave., Chicago, Ill.

ARCHITECTURAL DRAFTSMAN wanted. Desire contacting general, all 'round, experienced man. Write T. David Fitz-Gibbon, A.I.A., Architect, Royster Building, Norfolk, Va.

EXPERIENCED ARCHITECTURAL DRAFTSMAN wanted. Capable of design and development of working drawings for schools, hospitals, churches, warehouses, and public buildings. Give full details, education, experience, and salary expected, and when you will be available. Wayland & Fennell, 624 Idaho Building, Boise, Idaho.

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ARCHITECTURAL DESIGNERS AND DRAFTSMEN. Permanent openings in long established architectural office. Salary commensurate with ability. Replies confidential. McClelland & Jones, 706 Republic Building, Seattle 1, Wash.

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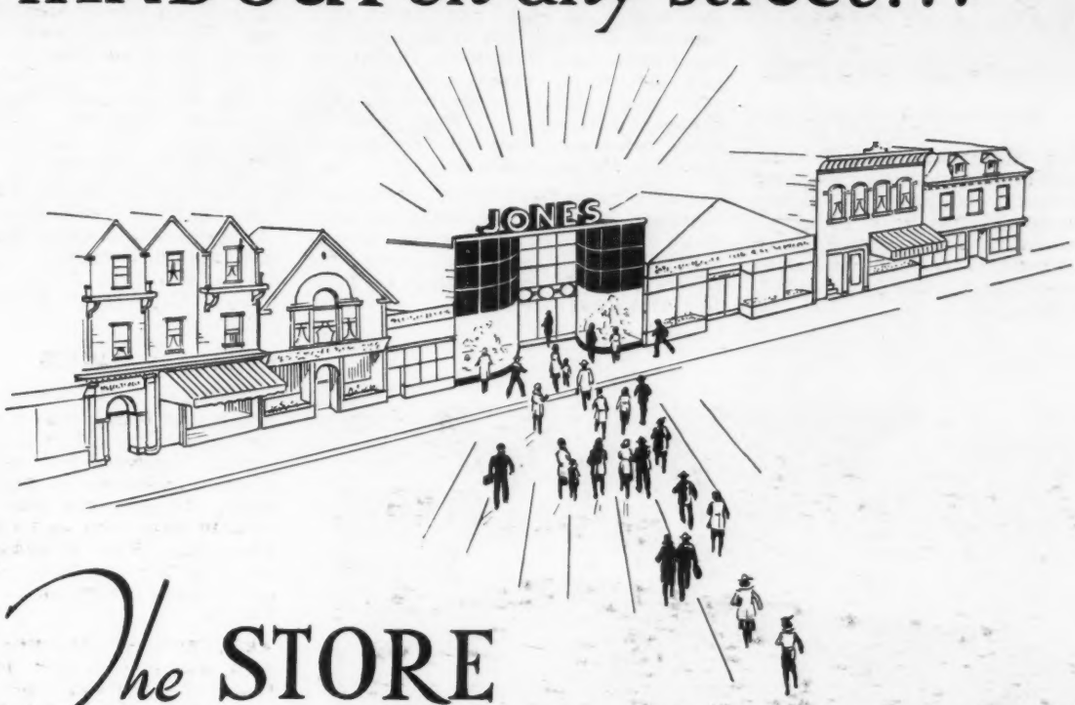
(Continued on page 14)

a STANDOUT on any street...



The STORE WITH THE Brasco FRONT

IT DOESN'T have to be eighty feet wide. With the brilliant beauty of a modern Brasco Front even the small shop can be the outstanding store on the street. For Brasco brings the magic touch of distinction to *any* store, regardless of size.

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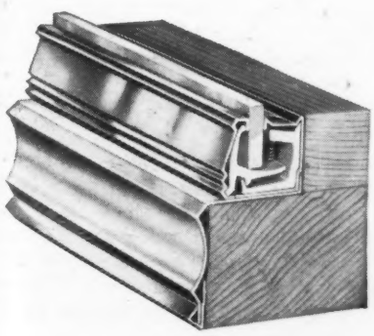

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Views

(Continued from page 12)

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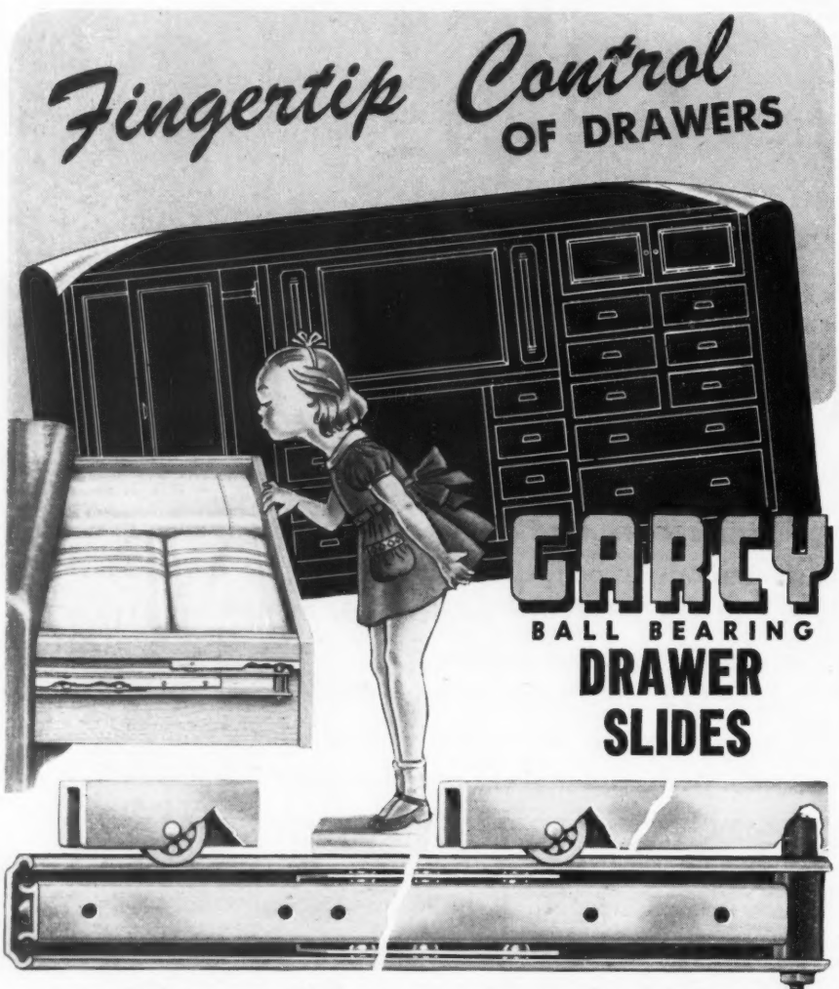
SEVERAL ARCHITECTURAL DRAFTSMEN, thoroughly experienced, able to prepare preliminaries, working drawings, etc., familiar all phases architectural drafting. Must think, draw along modern trend. Work on postwar theaters and diversified projects. Excellent opportunity for permanent position. Write education, experience, salary to M. J. DeAngelis, R.A., 1404-1405 Temple Building, Rochester, N. Y.

Capable, experienced ARCHITECTURAL DRAFTSMEN wanted for interesting work in progressive office in Maine. Salary subject to discussion, qualifications, etc. Write full details. Alonzo Harriman, 88 Shepley St., Auburn, Maine.



No. 361 drawer slide illustrated. Other types available for every drawer or shelf slide-out problem.

Tomorrow's homes will have more drawers than ever. Will they be the kind that stick and jam, fall out and strew their contents over the floor? Not if you specify inexpensive, easy-to-install GARCY drawer slides, the slides that keep drawers rolling smoothly and effortlessly, defying time and weather.

- Even wide, heavily loaded drawers pull out at a touch. No sticking or jamming.
- Ball bearing action . . . smooth and quiet,
- Drawers pull out all the way. All contents easily reached.
- Drawers easily lifted out, but cannot fall out.
- Standard lengths from 15" up.

FOR COMPLETE DRAWER SLIDE DATA — ASK FOR BULLETIN 39-30

GARDEN CITY PLATING & MFG. CO., INC.
Ogden Blvd. & S. Talman Ave., Chicago 8, Ill.

SITUATIONS WANTED

ARCHITECT, age 36, desires position with progressive West Coast firm. Registered Architect, State of Indiana, by examination. Twelve years' private practice, with commissions in varied types of work. Three years' executive experience in industrial and mechanical engineering. Work specimens and best of references available. Contemporary architecture preferred. Box 162, PENCIL POINTS.

ARCHITECTURAL DESIGNER AND DRAFTSMAN, now in war work, desires a position with a postwar future in an architectural establishment. College graduate with B.S. and M.S. degrees in Architectural Engineering and research work in housing. Reliable young married man preferring Eastern or Midwestern locality. Box 164, PENCIL POINTS.

ARCHITECT, age 38, registered in New York State. 14 years' experience architectural design and structural design, mostly industrial, commercial, and institutional buildings. Seeks opening with progressive architect or engineer in Florida or Western states. Capable of handling complete job, interviewing clients, superintending construction. Box 167, PENCIL POINTS.

NOTICES

DR. LOUIS PARNES, A.I.A., architect of the Community Building in Zurich, Switzerland, published in the June PENCIL POINTS, maintains an office for the practice of architecture at 2 East 86th St., New York, N. Y.

SEARLE H. VON STORCH AND F. CLIFTON PEARCE announce that they have formed a partnership for the general practice of architecture under the firm name of VON STORCH AND PEARCE, with offices in Suite 402, Scranton Lackawanna Trust Building, 506 Spruce St., Scranton, Pa.

GANNETT, FLEMING, CORDDRY AND CARPENTER, INC., Engineers, announce that GEORGE F. AXT has become associated with their company and is in charge of the New York office at 50 Broad Street.

HAROLD H. EATON announces the opening of an office for the general practice of architecture at 303 Bewley Bldg., Lockport, N. Y.

RAYMOND VINER HALL, R.A., announces the reopening of his office for the practice of architecture, at Lynn Hall, Port Allegany, Pa.

FOR A *Happy Entrance . . .*

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A Threshold of Alcoa Aluminum

A threshold of Alcoa Aluminum dresses up a doorway—residential, office building or industrial. Aluminum is durable, highly resistant to corrosion, and economical. Alcoa Aluminum shapes are made in styles to suit every type of threshold — the plain saddle, those grooved as you see them here, or the interlocking weatherstrip type. They come in long lengths, and can be cut to fit each doorway on the job, or furnished in suitable lengths by your supplier. Standard Alcoa Aluminum threshold shapes are not available now. They will be obtainable from building material suppliers all over the country, just as soon as war-depleted stocks can again be built up.

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News

Design and construction
Developments afield
Building Regulations

Major importance of the proposed General Motors Technical Center for "more jobs through research" was being fully emphasized by widespread publicity last month just as diligent Science presented a real research challenge—peacetime use of released atomic energy.

News releases on the G. M. "City of Science and Art" to be erected just outside Detroit indicated the completeness of this project, which is being designed by Saarinen and Swanson, Architects, Birmingham, Michigan. The Technical Center admittedly is being established primarily in the interest of the constant improvement of General Motors' products. Yet there is behind this immediate objective the broader intention to explore opportunities for serving human needs and aspirations in the postwar world.

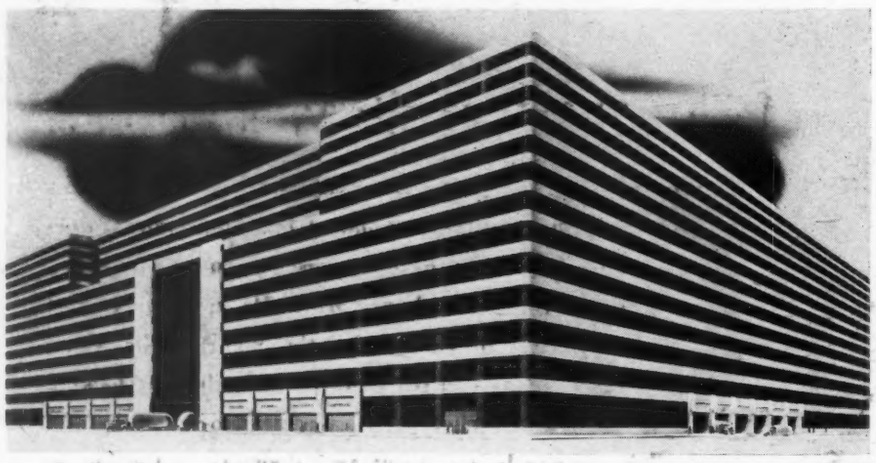
The lavish facilities promised by this undertaking, the daring of the architectural designs for the 350-acre Technical Center, promise realization of that "bigger and better" scale of activities envisioned by A. Lawrence Kocher and Howard Dearstyne in their ambitious proposal of an Architectural Center, presented in full in the July 1943 PENCIL POINTS, and more recently unfolded for British Architects in pages of *The Architects' Journal.* The estimated cost of the G.M. project has not been revealed but it has been referred to by Alfred P. Sloane, Jr., Chairman of the Board, General Motors Corporation, as "an investment in industrial progress."

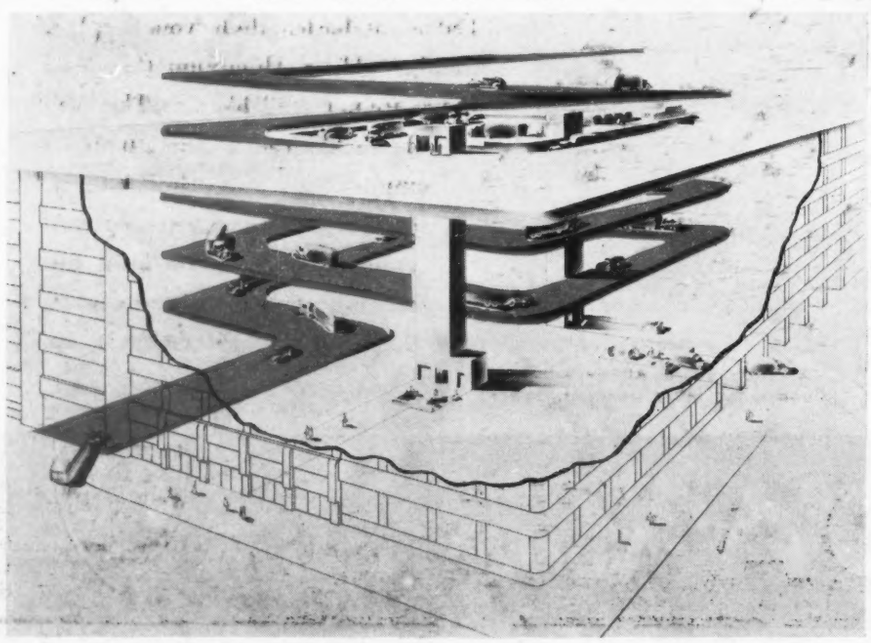
The G.M. research activities will be centralized in this Technical Center as soon as construction priorities will permit development of the research city. There will be an Administration Building containing offices for the central staff, a 1,200-seat theater, a dining room, and a display room for all General Motors products; to one side, a group of Research Buildings; a group of laboratories and shops known as Advanced Engineering Building; a unit known as Process Engineering Building; and, completing the impressive ring, a large Styling Building. Around the shore of the lake, which will supply water for cooling, there will be a central esplanade. The solution for motor traffic, full parking, roadways, etc., is in keeping with the grand scale of the enterprise.

"Shall we have simply another building boom in the postwar period or an intelligent and farsighted rebuilding of large sections of American cities as part of a comprehensive and balanced housing program?" asks John B. Blandford, Jr., in releasing an NHA bulletin analyzing availability of home building sites.

Methods that communities can use in assembling land for redevelopment, principally in central city areas, by bridging the gap between the acquisition price of the land and the cost of making it available as sites for new

(Continued on page 18)





A design innovation for handling motor freight deliveries—intended to remedy the usual choking of streets in commercial districts—is incorporated by Victor Mayper, Engineer, in plans for a $15,000,000 thirteen-story building to occupy a four-block site on Manhattan's lower West Side. From the street to the top floor, a 32-foot roadway for two-way traffic of the largest trucks and trailers allowed on New York highways will spiral on a 6½% slope, around a core of loading platforms and truck parking area on each floor level. Surrounding the driveway will be about four acres of rentable area on each floor for manufacturing and distributing organizations. There will be passenger and supplementary freight elevators, as well as circulating corridors. A tenant who drives to work will be able to use the "in-built highway" to reach his office door, if his company chooses to use a portion of the assigned parking area for company cars. The scale of this enterprise is indicated by the fact that traffic on the "in-built highway" will have to be keyed with city traffic by a stop-light system synchronized with lights on the adjacent streets of the strategic market neighborhood. Corners of the roadway, which rises one floor in each half turn, will be more rounded than the section suggests.

"It is not difficult to appreciate the contribution which this 'in-built highway' will make to the relief of traffic congestion on the streets of downtown New York, as well as to the elimination of shipping hardships traceable to sidewalk congestion, to elevator tie-ups, to mechanical breakdowns . . ." it was pointed out by David Tishman, president of Tishman Realty and Construction Company, proposing to build this Interstate Commerce Center as soon as construction priorities will permit.

New Inland *Alloy*

Opens Greater Opportunities for Vitreous Enamel in Architectural Design

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Whatever your design problem, Inland TI-NAMEL Steel offers advantages never before available in porcelain enameled products. Actual tests prove that the individual characteristics of TI-NAMEL permit the manufacture of panels that are flat and true to form. Also, TI-NAMEL eliminates the use of a ground coat. The thin finish coat, applied direct to the base metal—in white, or any shade—has longer service-life, and is less liable to damage.

Vitreous enamel on Inland TI-NAMEL Steel gives permanent beauty in an unlimited range of colors. It can be made in finishes from matte to bright gloss. Ask vitreous enamelers about TI-NAMEL, and write to Inland for a copy of a new bulletin which gives full details about this superior enameling steel base.

Principal Products: Bars, Floor Plates, Piling, Plates, Rails, Reinforcing Bars, Sheets, Strip, Structurals, Tin Plate, Track Accessories. Inland Steel Company, 38 S. Dearborn St., Chicago 3, Ill. *Sales Offices:* Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

Pending patent applications on the new enameling process and products made thereby are owned jointly by Inland Steel Company and Titanium Alloy Manufacturing Company under trust agreement.

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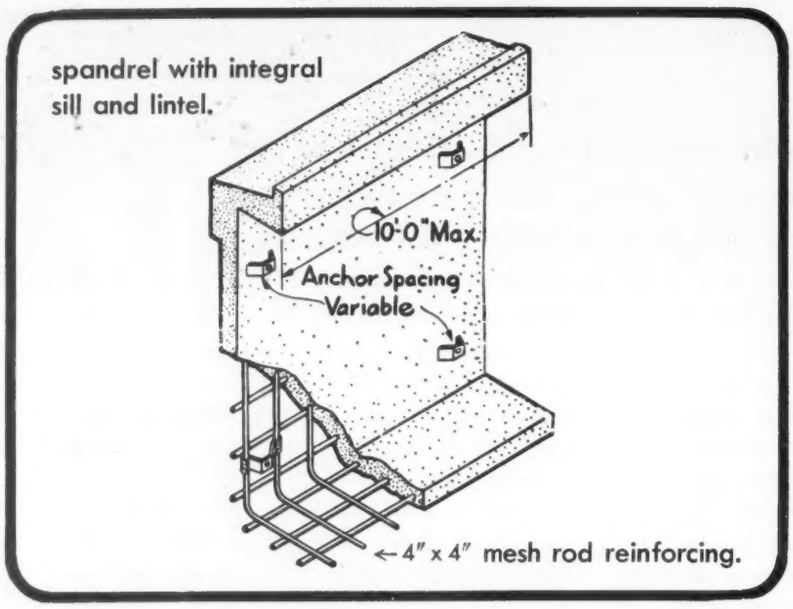
PREFABRICATION IN CONCRETE

Architectural Concrete Slabs reduce costs for flashing, waterproofing and erection

Thin, reinforced Architectural Concrete Slabs are designed as a *skin* that may be "wrapped" around corners, window reveals, sills and heads, and over parapet copings. They reduce the amount of flashing and spandrel waterproofing needed and eliminate the need for separate sills.

Thinness, light weight and large size assure ease and economy in erection. Lifting hooks for handling and loops for anchoring the slab to its supports are welded to or looped around the embedded reinforcement.

In multi-storied buildings, spandrels, extending from one window head to the sill above, may be made in a single piece. This not only reduces the cost of the finished wall... it improves the appearance and weather-resisting quality.



For further information see Sweet's Architectural File (4 B/2), or write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, New York.

PP-ACS-52

ATLAS WHITE CEMENT
For pre-cast ARCHITECTURAL CONCRETE SLABS

News

(Continued from page 16)

home building, are covered in the report of a study made by the Urban Development Division, NHA. It is pointed out that there is almost no experience to serve as a guide in this field, but many conclusions were reached as follows:

1. There is plenty of land in the center of almost all American cities to provide homes with openness and greenery, if the land can be made available on terms so that private developers can afford to use it without overcrowding.

2. To make this possible, it might be necessary to face a writedown in the price of central land of 60 to 70 percent.

3. Low-density re-use of the land is estimated on the average to produce a return of about 1.6 percent on the estimated acquisition cost.

4. To bridge the gap between this return and the cost of the money to pay for the land, public credit would have to be used and, in most cases, supplemented by contributions.

Status of legislation to facilitate urban redevelopment has been summarized by the Urban Land Institute in a report released recently.

Dividing current legislation into three classifications, the Institute reviews progress in the various states as follows:

Redevelopment Corporation Laws. (These bills encourage large financial institutions to participate in slum clearance through the construction of housing projects.)

Introduced in 16 legislatures (Connecticut, Illinois, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, Ohio, Pennsylvania, Washington, and Wisconsin).

Passed in 11 states (Illinois, Indiana, Kansas, Kentucky, Maryland, Michigan, Minnesota, Missouri, New Jersey, New York, and Wisconsin).

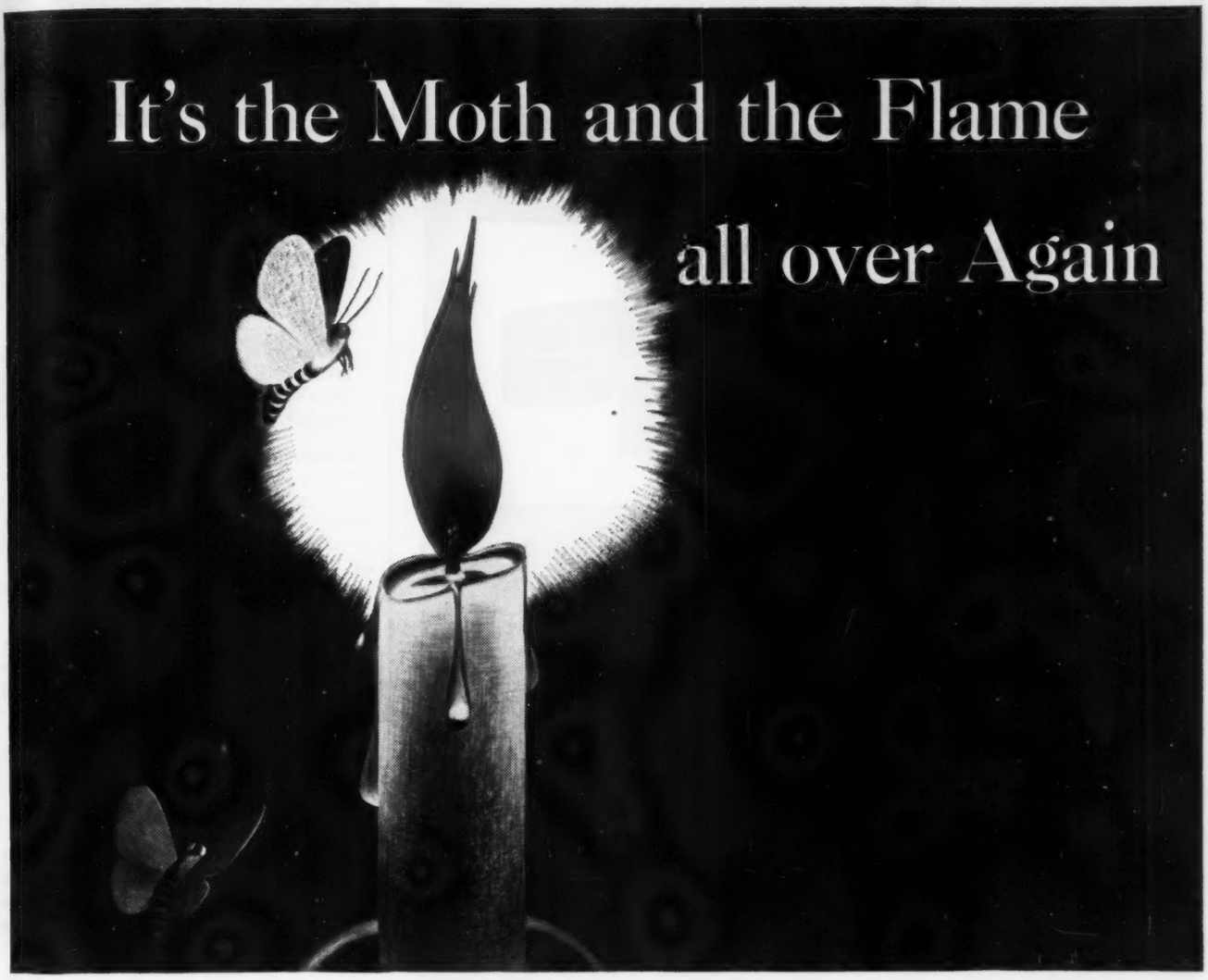
Killed in 1 state (Washington).

Housing Redevelopment Laws. (These bills enlarge the powers of local housing authorities, making them the development agency though control will still be largely through FPHA in Washington.)

Introduced in 18 state legislatures (Arkansas, Connecticut, Colorado, Indiana, Massachusetts, Minnesota, Nebraska, New Mexico, North Caro-

(Continued on page 20)

It's the Moth and the Flame all over Again



SHEETROCK *Fireproof* WALL *and* CEILING PANELS

Many people play the game of the moth and the flame. When their house burns, they find out too late that it lacked fire protection. That is why progressive architects and builders constantly seek safer building materials.

One safer way to build is with Sheetrock* wall and ceiling panels. For Sheetrock is made of gypsum, a mineral which cannot burn. In actual fire conditions, it has proved its worth again and again, confining the flame till help could arrive.

Sheetrock rivals the beauty of any wall material. Smooth surfaces, sweeping curves, decorative paneled effects . . . all can easily be had with Sheetrock.

Or, if you want wood-grained effects, choose from Sheetrock's faithful reproductions of knotty pine, bleached mahogany and walnut. This versatility is the reason why Sheetrock has been chosen for more wallboard jobs than any other gypsum wallboard in the world.

*Reg. T. M.

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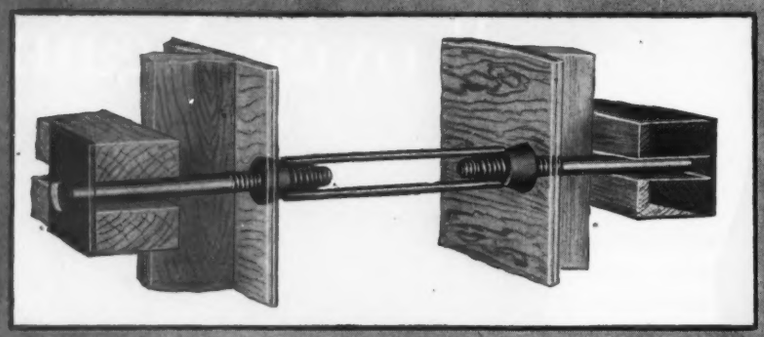
SPEED HEAVY CONCRETE WALL FORM CONSTRUCTION



Richmond Tyscrus are—

- High strength, light weight, form-tying devices with a range of sizes from 6,000 lbs. to 30,000 lbs. per tie safe load rating.
- Equally adaptable to plumb and battered wall construction. Use of Tycones to spread form work for required wall thickness is optional.
- Easily assembled by workmen as all of the threaded members have coarse, fast acting, self-locking threads.

Forms strip easily leaving a clean wall surface when Richmond Tyscrus are used. The bolts (Tylags) do not bind. Embedded Tyscru Coils can be used for convenient form reanchorage or scaffold support.

RICHMOND OFFERS—without obligation, consultation on best of ties and details of application to your form work; estimates on job requirements and recommendations on specific form problems.

RICHMOND WORKING PARTS—reusable accessories for Tyscrus including Tylags, Tycones and Flat Washers are furnished.

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816 LIBERTY AVENUE, BROOKLYN, N. Y.
MANUFACTURING SINCE 1911

TIME AND LABOR SAVING CONSTRUCTION DEVICES FOR CONCRETE CONSTRUCTION

News

(Continued from page 18)

lina, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Washington, Wyoming, and Wisconsin).

Passed in 1 state (Tennessee).

Killed in 8 states (Colorado, Indiana, Minnesota, Nebraska, New Mexico, Oklahoma, Rhode Island, and Wyoming).

Redevelopment Land Agency Laws. (These bills establish new redevelopment agencies which are controlled wholly by local government, with power to assemble land, issue bonds, and sell or lease land to private enterprise in accordance with an approved comprehensive plan.)

Introduced in 6 state legislatures (Colorado, California, Indiana, Maryland, Michigan, Pennsylvania, and District of Columbia).

Passed in 3 states (Colorado, Indiana, and Maryland).

Killed in 1 state (Michigan).

The award of PENCIL POINTS prizes in the recent competition for design of "A Professional Association Building" has been announced by the Beaux-Arts Institute of Design in New York.

First prize and a first medal were awarded to Miss V. Bowland of the University of Pennsylvania. The jury reported that her design "had a good plan skillfully presented." The program for the competition was written by John W. Root, Architect, of Chicago.

Second PENCIL POINTS prize and a first medal went to W. Fuchino of the University of Illinois. Second medals were awarded to John F. Pile and to H. K. Bischoff, both of the University of Pennsylvania.

NOTICES

ROBERT HELLER, industrial designer, has opened offices at 2 West 46th St., New York, N. Y. The organization will be known as ROBERT HELLER ASSOCIATES, and will include RUSSELL KROB, former instructor of design at Bennington University and JACK COBLE, formerly with Raymond Loewy Associates.

GEORGE A. LETTS announces the opening of his office in the Heights-Rockefeller Building, Mayfield Rd. & Lee Blvd., Cleveland Heights 18, O.

S. BRIAN BAYLINSON has opened new offices for the practice of architecture, after having been engaged in war work for the past two years. Address: 26 West 58th St., New York 19, N. Y.

Houses for the People

EXCERPTS FROM LETTERS RECEIVED BY THE LADIES' HOME JOURNAL

We've bought a house site on the waterfront. Even in-land here it's cold. Seldom misses a winter going down to 40 below zero and 50 below isn't unusual. The radio will report the "coldest spot in the U.S." and we're always from ten to thirty degress lower. And the waterfront is colder. Not in degrees always, but there we have the wind. O.K., do you think this house would be tight enough to really *take it?* With a wind blowing off the Lake of the woods, snow filters in our windows even with storm windows on. Are you sure we'd not find ourselves living in a snowdrift if we build one of these modern homes? Or are they built only for Florida and California? Besides the sun heat, how is it heated? (Coal will perhaps be our best postwar bet.) What about the flat roof, will it stand a really driving rain without leaking? What about these panels, will they fit tight enough against the floors to prevent a floor draft—something all of us in frame houses combat here from November 'til May. What are the floors made of? Just how fireproof is the building? Is a company really planning on turning out these ready-made panels? What is the name and address of the company? How much will a house like this cost for materials? Could one depend upon a good local contractor to put one together or would a man be sent to do the work?

As you see, I'm groping about a lot of things and I'm confused as to whether it would work in this climate but I like the idea so well that I want to be absolutely sure it wouldn't work here before we build something of the o'd style. Thank you for any information.

Mrs. T. J. C.
Williams, Minn.

At the moment, as everyone knows, there is a crescendo of nationwide interest in houses. The existing backlog of needs and desires for better living quarters is greater than anything in history. All prophets seem to be agreed that (beginning on B-day, whenever that is) there will be built in the United States from 800,000 to 1,250,000 dwelling units a year for the next ten years. In the face of such a tremendous prospect, many persons and organizations heretofore only casually interested in residential building are feverishly awaiting the production and release of materials and equipment so that they may ride profitably on the bandwagon. It may be worthwhile to examine the character and capacity of this bandwagon.

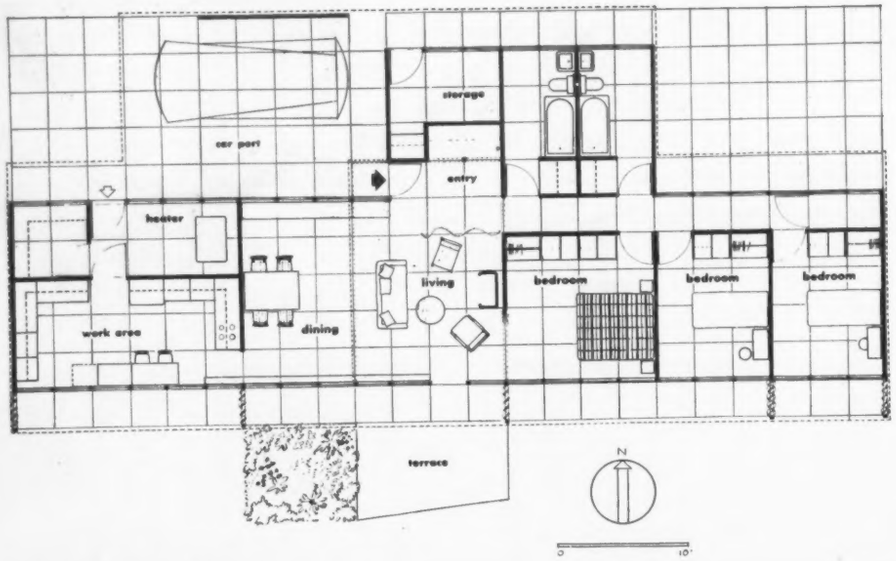
Most magazines serving the lay reader have been aware for some time of the impending boom in housing and have been in greater or less degree directing editorial attention to the matter of better home design. Each according to its lights has been publishing ideas and designs for houses prepared by or with the aid of architects—some conservative and some progressive, but all calculated to whet the public appetite for something better than it has been used to.

Some of these magazines have been helpful by conducting large scale national surveys to find out what people in general want in their postwar homes and what they are prepared to spend for them. While the results as found by different publishers vary, there is agreement on such pertinent points as that the six-room house for $6,000 is the most popular goal.

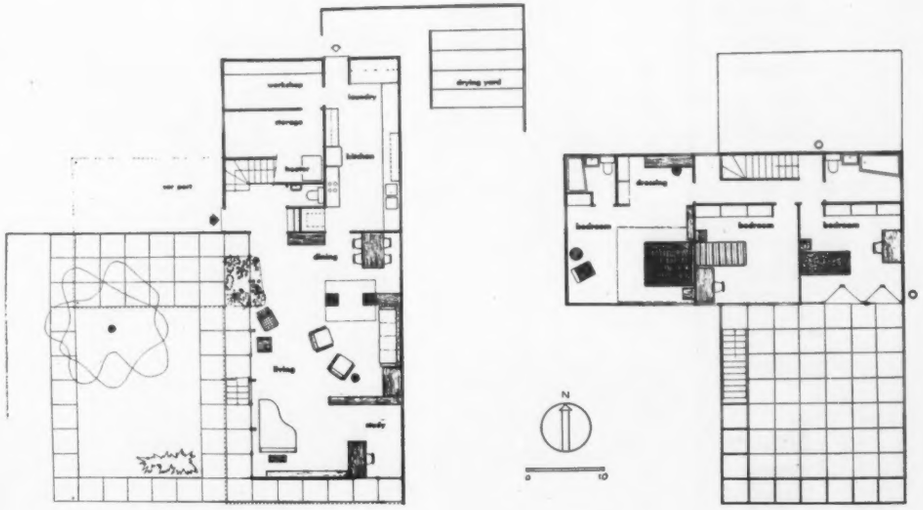
These surveys, of which several have been quite comprehensive and have gone into great detail, have revealed many significant facts. Among other things they indicate a distinct and strong trend away from traditional types of design and toward what has come rather vaguely to be called "modern." This trend, as might be supposed, is strongest in the West and, though definite, less marked in the East. The exceptional area is New England, where the preference ratio still stands about three to one for tradition. This, however, represents a surprisingly large advance for the progressive element up there. Not many years ago the vote would have been ten to one, or even more overwhelmingly against them.

Many factors, of course, have contributed to the changing attitude. The spirit of the times, technological progress, the effect of advertising, the influence of the movies, increased travel during the war, and access to more and more examples of modern design are some of the sources of change. One very powerful element has been the magazine press, which reaches regularly into the homes and minds of millions of families. As the editors of these lay periodicals have gradually become, with few exceptions, convinced of the validity of contemporary design ideas, they have exerted the force of their tremendous public prestige on behalf of the movement towards progressive architecture.

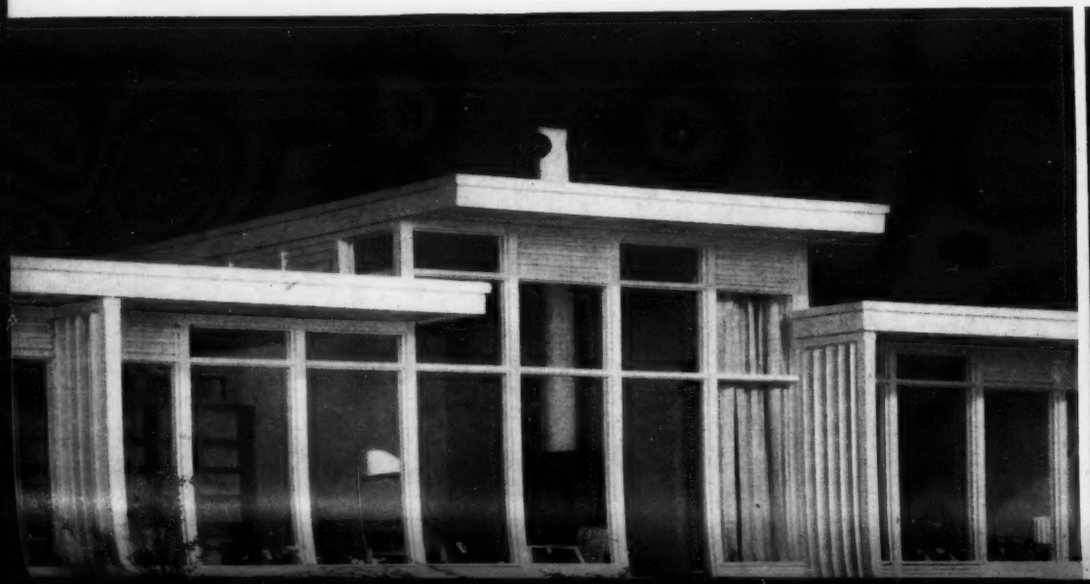
Houses designed for the Ladies' Home Journal

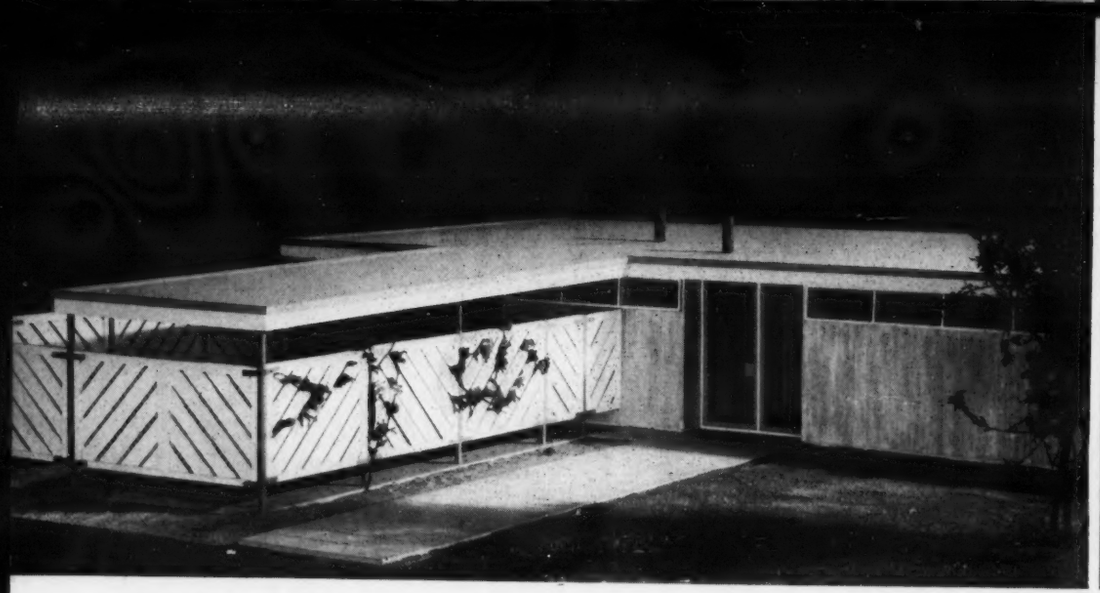


George Fred Keck, Architect

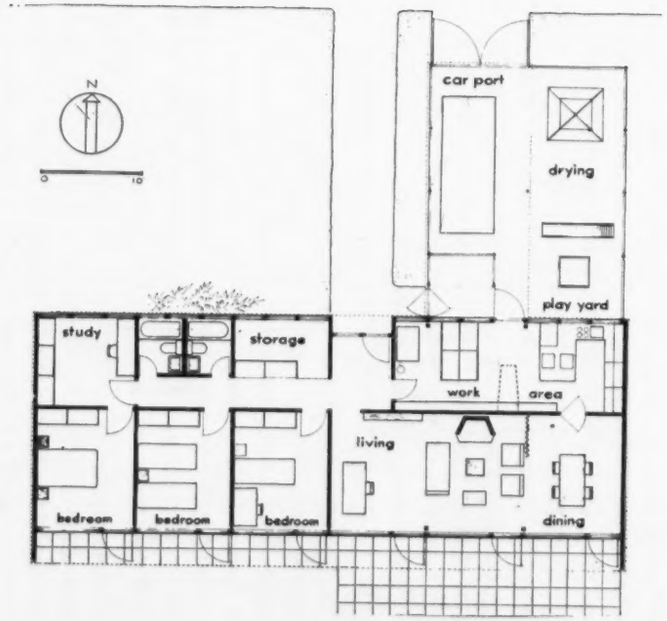


Carl Koch, Architect



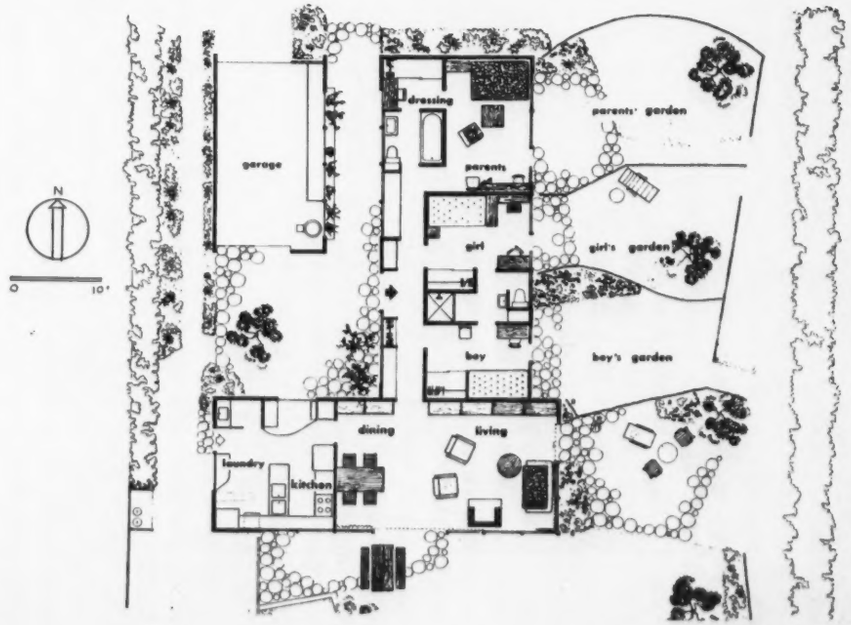


Philip Johnson, Architect



Marie Corbett, Architect

Garrett Eckbo, Landscape Architect



As an example of what a big national magazine has done to influence public thinking on the subject of domestic architecture we cite the contribution of the *Ladies' Home Journal.* Under the direction of its enterprising architectural editor, Richard Pratt, this publication has been running in each issue for many months, two or more pages presenting a house design prepared by some talented young architect. Now, that in itself is no new practice—magazines have been doing it for years. Mr. Pratt, however, looked a little farther ahead than most editors and laid down some unusual specifications for his architects to follow, pitching their thinking well into the future. The designs are all predicated on several far-reaching assumptions. First, the building industry is assumed to have arrived at a full mass production basis so that it can furnish, at low cost, a variety of prebuilt panels and parts which can readily and rapidly be assembled into houses. Second, building codes are assumed to have been brought up-to-date and liberalized to permit full use of the modern techniques and materials of building. Third, building labor has by this time become willing to accept the most efficient and time-saving methods of construction and put aside its one-time obstructive practices. If and when these conditions can be attained, the *Journal* readers are told, houses like the ones shown can be had for from $4,000 to $6,000.

The presentation of the designs in the *Journal* showed plans and photographs, in color and black and white, of extraordinarily well-made scale models which skilfully simulated the actual houses that might one day be built. The effect was tremendously realistic and convincing and the *Journal* received and is still receiving thousands of letters from interested readers who were delighted at the prospect, however remote, of getting such houses for the cost suggested.

The houses were good enough to attract the attention of the Museum of Modern Art in New York and arrangements were made to exhibit eight or ten of the models in the Museum from May 29 to September 30. Thousands of people have already seen the show there and have undoubtedly had their thinking influenced. The average attendance at the Museum up to July 4 was 1,550 persons a day, and the largest attendance for a single day occurred on the holiday of May 30 when 3,551 persons crowded into the exhibit.

Like the readers of the *Journal,* the people who have been visiting the Museum show are average individuals and families who are attracted by their interest in houses for after the war. The reactions to the models are very similar to those reflected in letters received by the *Journal.* In general they appear to find the houses acceptable and highly attractive, but they do raise questions about the practicality of so much glass, about the strength and waterproof qualities of the flat roofs. They inquire about such things as the cost, maintenance, and storage of screens, about the possibility of using traditional types of furniture, about the cost of extensive curtaining, about the apparent absence of cross ventilation, and about the presence of insects in association with such interior features as the planting area inside the living space of the house by Frank Lloyd Wright. Some of their questions are hard to answer.

The Museum authorities are careful to emphasize the improbability of getting houses like these for a long time to come for anywhere near the prices that have been held out as future possibilities. Nevertheless, in spite of this warning and in spite of the frequent reiteration by the *Journal* of the premises upon which the whole project is based, a large part of the public has acquired a strong belief that the housebuilding millennium is at hand.

We have asked Richard Pratt, who sits where he can feel the pulse of the ambitious homebuilders of the land, to translate their reactions to the *Journal's* hypodermic program into general terms that may help architects, who are used to the moderately prosperous type of client, to understand the mass market. He says, "Thousands of readers have written in about these houses, but millions of readers haven't. However, if it means any-

I have been keeping a scrapbook of ideas for our postwar home and have never found a house plan that strikes me as so nearly my ideal as the one appearing in the January 1944 *Journal,* "The House Planned for Peace."

I am wholeheartedly in favor of purchasing a prefabricated home and am very anxious to learn what progress has been made, especially with reference to the one mentioned.

Mrs. A. R.
New Orleans, La.

In the July 1944 issue of the *Ladies' Home Journal* you had an article describing the "Solar House." Because of your article, we have changed our ideas in respect to what we wanted in a home. We have visions of nothing else but one of these homes after the war.

Mr. & Mrs. W. B.
Racine, Wis.

We are very interested in your models of postwar homes that have recently appeared in the *Ladies' Home Journal.* We were planning on building a one-story, five rooms and bath, brick home—but after seeing these postwar home models are considering waiting if there is any real assurance that they can be built for, as you predict, four or five thousand dollars after the war is over.

A. M.
W. Toledo, Ohio

I have looked and finally found our dream home in the October 1944 issue of *L.H.J.* on page 86 and 87. But there are a million questions I want to ask. For instance, why does the architect place the refrigerator in front of the kitchen window? and is that a dropleaf table in the kitchen? and where are all the cupboards? They can't be on the window wall side, and the stove is on the other side. What are the dimensions of the rooms? In the dining end of the living room, are those built in cupboards along that long wall?

Mrs. M. S.
Richmond, Calif.

I am very much interested in your article in the November issue of *The Ladies' Home Journal* and believe that houses of the type which you discussed are to be a reality in the near future.

C.O.H.
Durham, N. C.

I saw your illustration entitled "Every Family's Right" in the September issue of the *Journal*. I had heard of plans to provide a really "livable" home that would meet the moderate income group, but I had never seen any actual designs prior to reading your article. Being a family man, I was quite impressed with your model future home. Certainly it provides every health-giving aspect along with adequate living space, and if it really can be built for the amazingly low price which you mentioned, it will surely bring added happiness into many an American family. I have felt myself that it has been a black mark against humanity not to have been able to give the American family a decent home without the terrific struggle that it has represented.

What I am primarily interested in is to find out if these homes are really in existence now, or if they will be built as you picture them by someone after the war is over, or whether they are just pictured more or less as a hoped for future accomplishment which will be dependent upon postwar conditions.

T. M. P.
Bridgeport, Conn.

My wife and I have studied with a great deal of interest "The House With a Plan for the Future" in the October issue of the *Ladies' Home Journal*. We feel that this is the best design of modern home which we have seen.

Would you please advise us how we may obtain more complete details, plans, etc.

W. I. F.
Vancouver, B. C., Canada

I am very much interested in plans for postwar houses, so when I ran across your Good Neighbor house, I became ecstatic; when I saw the kitchen plans, well that was completely out of this world, until my husband brought me back to earth with a bounce. He wanted to know how it was to be heated, and also since everyone will probably continue their victory gardens after the war as we intend doing, well then, where would your fruit cellar be?

Mrs. J. M.
Chicago, Ill.

I am so "carried away" with your "Easy to Live In" house in January 1945 *Ladies' Home Journal* that I just have to thank you for it. Of course, I am going to have one just like it!

P. L. A.
Headland, Ala.

thing at all that only five or six letters in a thousand were antagonistic in tone, then it should be safe to assume that progressive design can count on countrywide customer acceptance. Remember, though, that it was more than progressive design that people were writing in about. There was the matter of more and better houses for less money. That was the thing for which thousands cheered.

"At the Museum the emphasis is on the esthetic aspect (largely); in the magazine I have stressed the economic angle. And this latter should be kept in mind as I pass on my impressions of our reader response. For while many people remarked upon the use of so much glass (in terms of heating, privacy, and keeping it clean), they were clearly more concerned with the hope I held out to them that new methods and new materials could greatly lower the cost of occupancy.

"From the very start I was struck by the extraordinary lack of opposition to the appearance of the houses. A typical attitude was taken in the somewhat more than typically articulate letter that came in the other day from a Mrs. Mullen, of Vancouver, Washington. She said, 'I'm completely sold on these new houses. I even like the looks of them, *since I have never harbored any preconceived ideas about how a house ought to look.' What* really mattered to Mrs. Mullen was that she could 'scarcely wait till these houses accomplish the emancipation of women from slavery.'

"I have noticed a mild concern in connection with the flat roof—not with the way it looks but with its ability to support snowload and protect indoors from the heat of the sun. On this point (and many others) it delighted me to discover how many average readers take it for granted that there must be a very simple technological solution, as indeed there is.

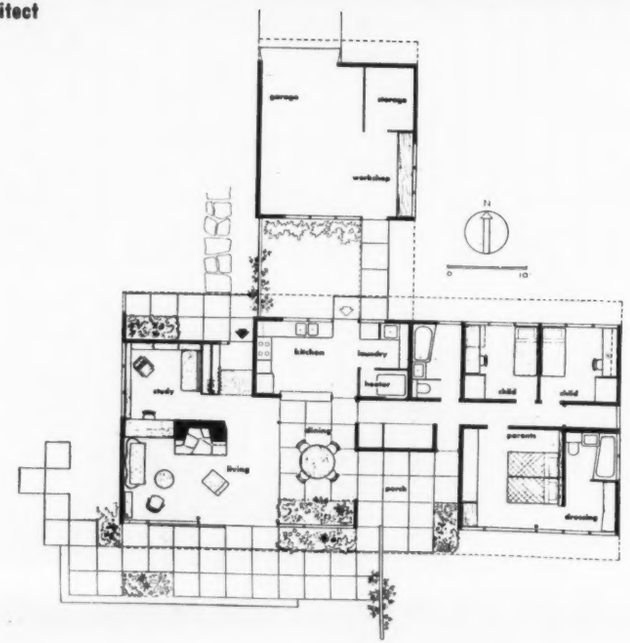
"From the scarcity of comments on the absence of attics and basements I would gather that these were now regarded more and more as vestigial appendages. People, however, do want plenty of storage space, and I think it is a valid criticism of some of our designs that not enough was provided in the plans.

"People's puzzlement with 'prefabrication' keeps cropping up in our correspondence, even though I have purposely avoided using the term in any form. They seem, on the whole, to accept and understand the general principle of sectional construction, as opposed to conventional, and seem convinced that houses assembled of sizable, lightweight, and highly simplified mass-produced parts can be much less expensive than houses put together in the familiar complicated and costly fashion still current. In other words, most of the letters reflect a comprehension of what is meant by the manufactured house as described in the magazine for more than a year. I think they expect a certain uniformity as far as the general shape of houses is concerned, and are not particularly disturbed by this if they can have the room arrangements they want, a choice of colors and finishes, and of course the last word in mechanical equipment. Ease of operation and management comes next, in my opinion, to purchase price and cost of upkeep, as features of deepest interest."

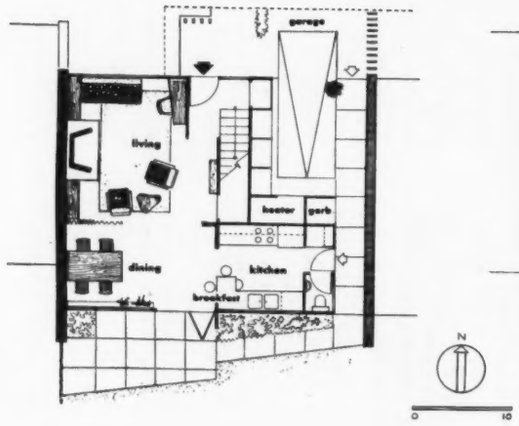
There is no doubt, in the face of evidence that has been collected, that the public wants a great many things that it has not been able to have in the past. It is the belief of the *Ladies' Home Journal* that the people can have these things in the future if they become sufficiently aroused to apply mass-pressure on legislative bodies and manufacturing corporations to cause the necessary steps to be taken. The *Ladies' Home Journal* program has been beneficial to the extent that it has stimulated widespread interest in and appreciation of the ideas of progressive contemporary designers. It may prove harmful, however, to have aroused prematurely a public appetite which cannot yet be gratified within the means available to the average family. Time will decide that.

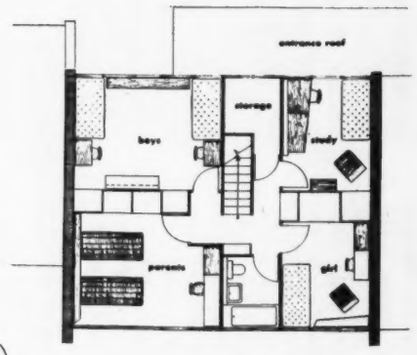
The *Journal* houses, while they have many merits, are not invulnerable to architectural criticism, particularly if approached from the viewpoint of present day actualities. A competent architect of wide experience has set

Hugh Stubbins, Jr., Architect



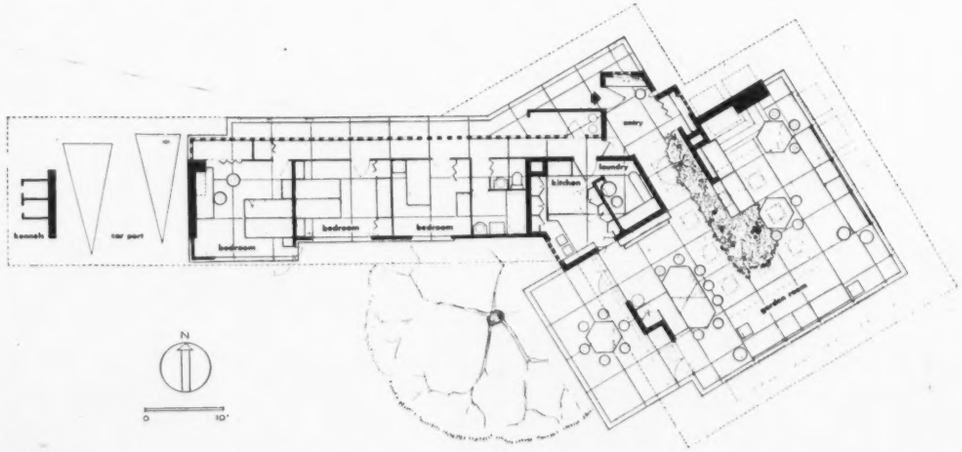
Vernon DeMars, Architect

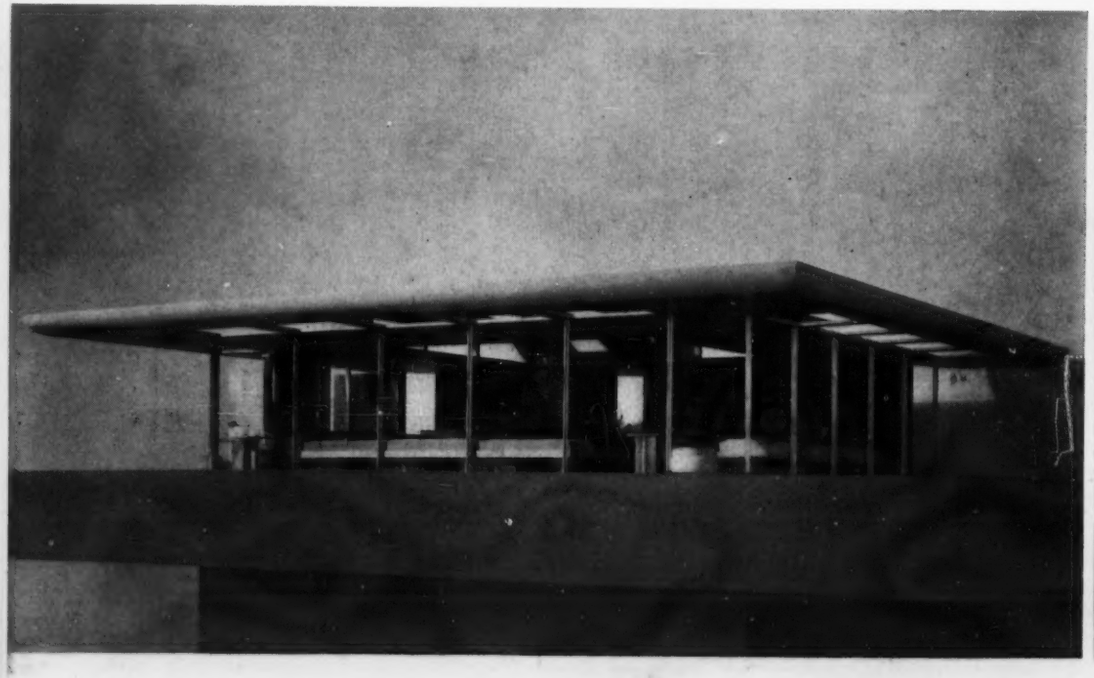




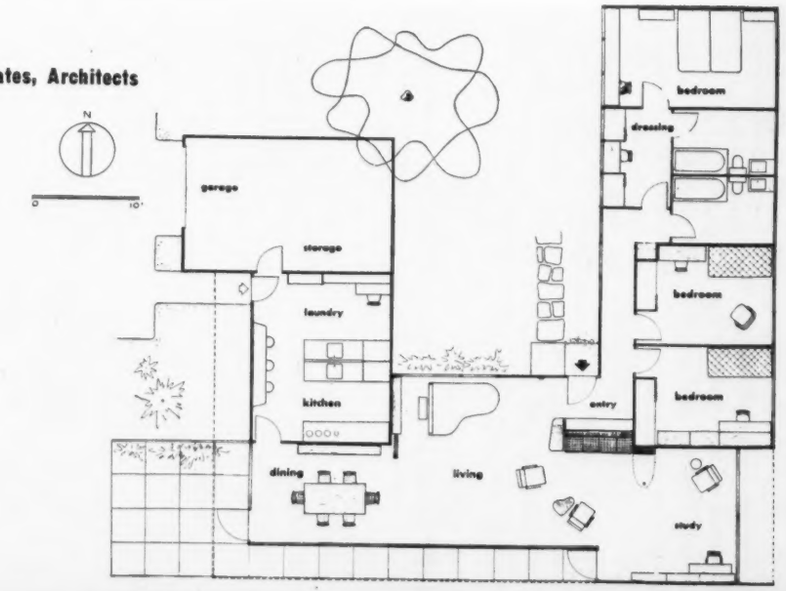
Houses designed for the Ladies' Home Journal

Frank Lloyd Wright, Architect





Plan-Tech Associates, Architects



down for us a number of faults he has found in the plans. We regret that lack of space precludes enumerating them here, but knowing our readers we have little doubt that each observer can find for himself many points of design in these houses with which he can take issue. Neither do we doubt that each designer of these houses can defend his design and answer the critics to his own satisfaction. But, so far as we know, no one claims that these are perfect houses or even the best these particular men could do. The real point is not their degree of perfection but the question of whether or not they represent what the public really wants and are conceivably attainable by the lower income group within the days of our years.

For the moment, the *Journal's* suggestion that these houses would eventually be within reach of families whose incomes range from $2,000 to $3,000 a year leaves the immediate postwar homebuilder high and dry. It is obviously impossible for such houses to be built "for from $4,000 to $6,000" within the reasonably near future. What the consumer can safely expect and how much he can actually afford to pay for a new home during the next few years are questions that deserve careful analysis. The following discussion written by a reputable economist may seem to many to err on the side of conservatism. Economists, however, have a way of looking soberly at statistics and producing from them conclusions that are borne out by subsequent events. Perhaps it is not too bad an idea to consider this analysis as an antidote against the over enthusiasm of the more exuberant prophets. K.R.

May I, just an ordinary housewife, give two or three hurrahs, with a few extra handsprings thrown in for good measure, for the house plan shown in the January issue? It's lovely, it's my dream come true and suits my family of four exactly but there are some questions I'd like to know about it.

Mrs. J. T. W.
Hammond, La.

Everyone tells me that I am foolish to ever hope to have a modern home and kitchen such as you have printed and drawn in the February issue of the *Journal*. Well maybe I am wrong to hope, but I honestly believe it can be done. Why would the *Journal* go to all the expense to publish these articles if there were no truth in them. I sound like I am trying to sell the idea to you, but I am just trying to convince myself. I can't seem to convince anyone else.

Mrs. O. D. C.
Hillsboro, N. C.

Can America Afford New Houses?

BY ALFRED W. McQUILLAN, JR., CONSULTING ECONOMIST

A favorite pastime of dilettantes in prognosticating the future is to state glibly what the postwar residential construction market will be in size, quality, and value. Their forecasts range all the way from 500,000 new non-farm homes a year to 1,750,000 a year for the next ten years with average values per home running from $3,000 to $6,000 or $7,000. Obviously, we cannot hit all these predicted high and low spots. Somewhere within the limits of such estimates is an attainable but perhaps not a foreseeable level.

The problem is essentially one of economics and the economic factors may each be isolated and analyzed. But unfortunately this segregation and analysis does not lead to an inevitable conclusion. Economic theory does not operate in a vacuum, a truth which too many economists fail to realize, but must operate within the limits of a social order.

Our experience has been with a system of laws democratically arrived at and within which economic law has been reasonably free to operate without restraint. On the basis of this experience and on the assumption that we will return in this country to a system of laws reasonably similar to those with which we have been familiar, the predictions in this article are made.

Before attempting to view the prospects of postwar non-farm residential construction, it is important to understand the obstacles which have traditionally kept housebuilding from becoming a mass production industry and also the cost factors which govern its volume.

Before the prospective homebuilder can build the home he desires, he must find the land upon which to build, for it is not solely upon land in general that he is going to erect his house, but upon a certain specific piece of land which, for one or many reasons, is attractive to him.

The particular plot, in its turn, determines to a considerable extent the size and value of the house. If the land is urban, the dweller is concerned with utility problems, tax problems, and the general character of the neighborhood, while in rural areas, if drainage is good, if roads accessible, and water attainable, the utility and neighborhood problems are not likely to be important.

To be suitable for housing, a location must have certain characteristics, among which the following are especially important:*

(1) It should be in the path of urban growth for the type and class of dwelling proposed.

(2) The structures already standing should be in harmony with the proposed dwelling.

(3) The site should be capable of preparation without undue expense for the class of dwelling proposed. It should be free from the dangers of flood, subsidence, earthquake, or tornado, and not exposed to health hazards caused by fog, smoke, chemical fumes, stagnant ponds or marshes, poor surface drainage, or excessive heat or dampness.

(4) The location should be protected from inharmonious land uses by natural barriers, zoning, protective covenants, or preferably all three.

*Source, Rating of Location, Underwriter's Manual, Federal Housing Administration, 1938.

(5) It should be accessible at reasonable cost and time, through customary means of transportation, to schools, shopping centers, religious and recreational facilities, and places of employment.

(6) It should have streets and utilities suitable to the proposed development.

(7) It should have some natural or created appeal as a residential neighborhood, such as beauty of terrain, landscaping, layout of streets, and absence of noise, traffic hazards, billboards, and other objectionable structures.

Naturally, a location which combines all of these characteristics is not easy to find. Yet this obvious limitation to homebuilding is often neglected in forecasts of residential construction. In any metropolitan area where suburban developments have grown up one may see large subdivided tracts which have been passed by in the move toward outlying areas. For one or more of the seven reasons listed above these lands were not attractive.

The FHA has released some very revealing information on the relationship between the valuation of improved land and the valuation of the property. Since low-cost housing can only be built on low-cost land, the price of land is the greatest single factor in determining its availability for housing—whence has come the search for cheaper land that has led people into the outskirts of cities and which has led to the development of suburban areas.

From Table I we see that there has been a steady decline in the average relationship between value of improved land and total property valuation for new single family dwellings. In 1937, land value represented slightly over 15% of total property valuation, whereas by 1940 it had declined to less than 13%. This same Table I also reveals that land as a percentage of total property valuation ranged from 10.5% in the $2,000-$2,999 class to 18.7% in the $15,000 and over class.

This table clearly indicates that, as housing costs move down, land values become a smaller percentage of total property valuation, the implication being that, if low-cost land within easy access of metropolitan areas cannot be found, low-cost housing cannot become a reality.

There has long been a trend to build away from congested centers and out into open country—a move brought about largely by the use of automobile and bus. No doubt this mode of travel will increase from now on and the private use of the airplane will add further range for building.

When the average family buys a house, it makes the most expensive purchase of its life. When it rents a house, the amount it pays in rent is larger than any other regularly recurring family expenditure except for food. Therefore, the average family that builds must give considerable thought to the cost of the house itself apart from the cost of the land, if it is to proceed with wisdom and caution.

Before committing himself to the purchase of a home there are three distinct elements of cost which every prospective home owner should explore. These are: (1) the actual construction of the house; (2) its operation and maintenance; (3) the terms of its acquisition.

All three are interrelated. If inferior materials are used or the standard of workmanship is lowered, production costs may be reduced but maintenance costs will rise. On the other hand, if the best of materials and workmanship are used to avoid high maintenance

TABLE 1.
VALUATION OF IMPROVED LAND COMPARED WITH PROPERTY VALUATION

Property Valuation Classes	U. S. Total		Inside Metropolitan Districts		Outside Metropolitan Districts	
	Average Land Valuation	Land as a Per Cent of Property	Average Land Valuation	Land as a Per Cent of Property	Average Land Valuation	Land as a Per Cent of Property
Less than $2,000	....	....	....	....	$199	11.0
$2,000 — 2,999	$282	10.5	$303	11.1	263	10.0
$3,000 — 3,999	383	11.0	402	11.4	343	9.9
$4,000 — 4,999	529	12.0	553	12.5	451	10.3
$5,000 — 5,999	642	11.9	654	12.1	577	10.8
$6,000 — 6,999	834	13.3	848	13.5	740	11.8
$7,000 — 7,999	1,056	14.4	1,078	14.7	906	12.4
$8,000 — 9,999	1,307	15.2	1,325	15.4	1,199	13.9
$10,000 — 11,999	1,708	16.2	1,739	16.4	1,532	14.6
$12,000 — 14,999	2,302	17.8	2,326	18.0	2,172	16.9
$15,000 and over	3,264	18.7	3,264	18.7	3,268	18.6
All Classes: 1940	662	12.7	698	13.1	508	11.0
1939	724	13.5	770	13.9	534	11.4
1938	785	14.2	848	14.7	568	11.9
1937	913	15.3	1,011	15.9	691	13.5

Source: Federal Housing Adm., Seventh Annual Report, 1940.

costs, the production cost may become too high. Naturally, the mortgage and interest rates importantly affect the kind and quality of house the average purchaser may buy.

Repair and maintenance costs on houses have not had any very intensive investigation and there are but little worth-while data available on yearly averages. One reason for this lack of pertinent data is the fact that most of this work is done by local carpenters and small contractors who do not keep accurate records and who are rarely questioned on this subject. Permits are not even issued on a great deal of this work. The Department of Commerce has, however, estimated that maintenance expenditures on residential properties from 1915-1937 averaged about 0.8% of their value. Of course, such costs would vary for different families and locations.

According to the Department of Commerce, again, there is an average increase of about 2.5% a year in our inventory of homes. If repair maintenance costs are approximately 0.8% a year of the value of existing homes and if the value of new homes is on a par with the value of existing homes, then expenditures on repair and maintenance per year should be about 25% of the expenditure for new dwellings.

Cost of construction has always been notoriously high, for many complex reasons. The basic cost of non-farm residential construction, materials and labor, increased during 1936-1940, but despite this the average cost declined about 14%. However, the decline was due to increasing demand for smaller and cheaper houses. Little or none came from greater efficiency or technology.

From the FHA's records of insured loans on new single family houses, we find a decline in average value from $5,978 in 1937 to $5,199 in 1940, or about 13%. This is explicable by three factors: (1) a shift of FHA financing from houses in the higher income class group to those of the medium income classes; (2) cheaper land; (3) reduction in average number of rooms.

Reductions in construction costs may happen in two ways: (1) by changing the nature of the house itself, including materials; (2) by modifying the processes of assembly. The essentials that make a house attractive are *design* and *living comfort*. The very character of a house suggests possibilities for modifying design and construction to gain greater economy without reducing essential comfort. However, there are certain characteristics of the house and of the prospective owner which tend to make difficult these two changes.

On the one hand, the house is influenced by tradition as well as by the land upon which it rests. On the other

hand, traditional design and processing methods are hard to escape. A potential homebuilder is not easily convinced that change in process or design is desirable.

Unlike standard products for mass consumption, a house is, even when reduced to its simplest form, large, complex, and expensive. It is not like articles which can be made by repetitive processes and used identically by consumers throughout the country. Each climatically different area requires different construction features, and each income group within each area requires a different type of house because of its own special demands.

A psychological factor which impedes full attainment of the potential demand for new homes, and which is never given consideration by research analysts exploring the new housing market, is the fact that most prospective buyers have developed rather definite ideas of what they want. Product advertising has made a number of equipment items seem to them essential. The inclusion of the desired items in a new home immediately puts that home out of the price range the prospective owner can afford. The fact that he does not have these items in his present home does not moderate his insistence that they be included in any new home he would buy. So, rather than accept less than he desires, he will remain in his old quarters.

Furthermore, the housebuilding industry is traditionally localized. A house is ordinarily put together and used at the same place. It is identified not alone with the site but also with the utilities which serve it and with such other community facilities as schools, churches, fire and police protection, and hospitals. Since the building of a house is subject to all local regulations, customs, and practices, the non-resident builder is at a disadvantage. Consequently, except in large urban areas, the formation of housebuilding organizations large enough to utilize industrial methods is hampered, and we have had a localized industry as well as a costly one.

In all mass production industries, integration of operations is the basic economy factor. The practical impossibility of such integration in the housebuilding industry has been one of the major obstacles to low-cost housing. The average builder is poorly staffed, lacks financial resources, uses labor and materials inefficiently, and is dependent upon many factors beyond his control. This looseness and lack of organization is in contrast with the integration of processes in other industries in which great cost savings have been realized. Each segment of the housebuilding industry operates almost independently of the others. Each of the uncontrolled, uncoordinated managerial factors—the material manufacturers, building supply dealers, general and sub-contractors, laborers and buyers—is trying to protect its own interest with little regard or responsibility for the interest of the industry as a whole. The general contractor, nominally in charge of construction, rarely undertakes much of the work himself. If he specializes in wood-working, for example, he usually has sub-contractors do all of the other work, though occasionally he does both masonry and carpentry.

It was because of these inefficiencies that in 1940 and 1941, notwithstanding the movement to cheaper land, the use of cheaper materials, and a reduction in the size of houses, the housebuilding industry was still unable to meet the potential demand for a cheap house.

The Temporary National Economics Committee in its Monograph "Towards More Housing" had this to say:

> *"The belief that there is only a limited amount of work to be done prevails throughout the building industry. It serves both to raise money charges in the industry to uneconomic levels and to restrict productivity. Manufacturers of building materials maintain prices at sufficiently high levels to insure a profit at comparatively low rates of operation. Labor sets its rates of wages at high levels upon the assumption that there is only a certain amount of work to be done. Both labor and manufacturers are sufficiently well organized to enforce their demands. Their excess money charges although they do not yield their recipients a necessarily large return, at least in the case of labor, restrict demand, reduce employment and encourage further efforts toward wage and price increases."*

Now the custom-built market for those ready and willing to spend what they have to in order to get what they want will always be there. Our concern with the future home is with the kind most adaptable to the low income market and with the problem of producing and distributing the needed amount of housing for the low income market.

In *Fortune*, May 1938, appeared the following:

> *"There is one primary necessity of a good life that $30.00 a week will not provide in most urban communities . . . and that is adequate shelter. And where it will provide adequate shelter it will not provide housing on a scale even approaching the standards of comfort, convenience and luxury that the $30.00 a week man obtains from his other expenditures.*
>
> *"The spending of thirty dollars a week and less very largely supports U. S. industry, with one important exception. That exception is the disorganized and warring group of organisms euphemistically known as the building industry. In fact, the building industry by and large does not look upon the mass market as a primary or even as a possible market for housing, and whatever technical advances it has made have been in the field of ornamentation rather than in cost reduction.*
>
> *"Whether the fault lies with the industry itself, or with uncontrollably high basic building costs, or with government housing policy, the fact remains that the situation is bad for the building industry, bad for society, and most immediately and painfully bad for the $30.00 a week family and for its less prosperous neighbors."*

These many diverse managerial interests must be unified if the housebuilding industry is to be integrated sufficiently to lower costs and allow it to adopt mass production.

Looking upon the brighter side of this intricate problem, certain changes have taken place and are now taking place which will tend to industrialize housebuilding. Standardization and simplification of parts have been gradually evolving for years. Prefabrication and the movement into the prefabricated housing field of such companies as United States Steel and Goodyear Tire and Rubber Company indicate that the integration of operations in this industry will become in the not-too-distant future an accomplished fact.

The kind of policies which evolve in the postwar era, both public and private, will substantially determine the kind of new residential building market to be expected. One well known economist in the building materials field has listed five basic factors which, in his judgment, will determine the outlook. These five factors are: (1) national income; (2) the accumulation

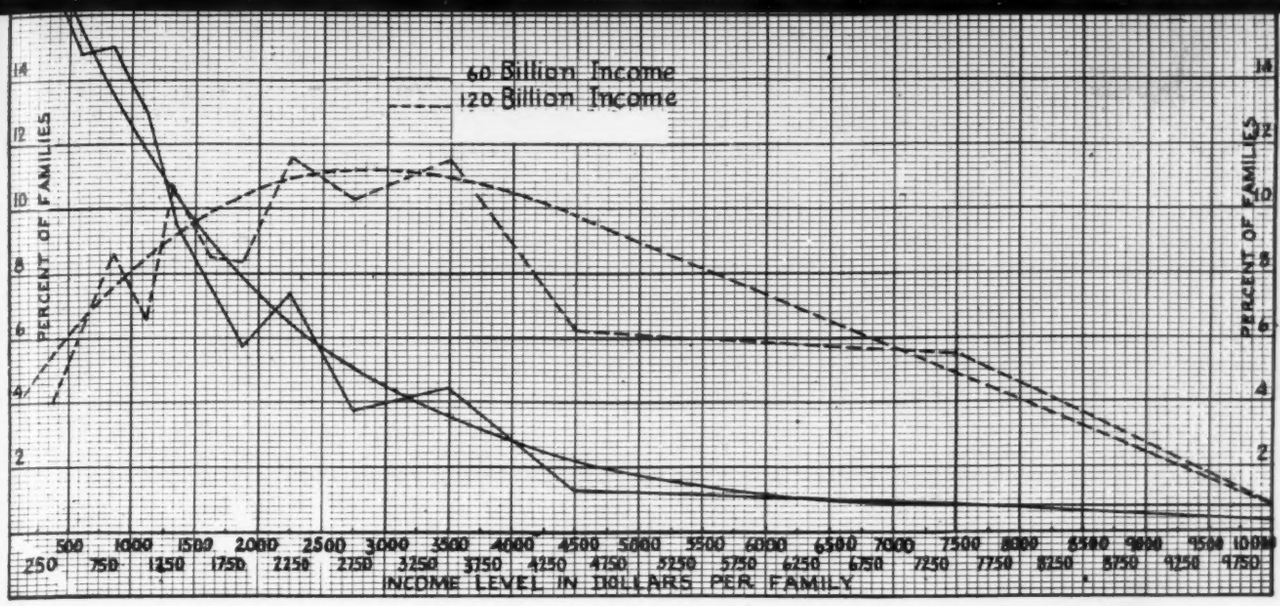


Fig. 1. Redistribution of Family Income Groups in moving from 60 to 120 billions of dollars of national income, assuming that the movement involves a shift of 5% toward equality of income. Based on "Studies in Wartime Planning for Full Employment" by NRPB, August, 1942.

of savings from the war years; (3) physical need for housing; (4) the cost of home ownership; (5) psychological factors.

Since our economic structure is made up of a number of interrelated and inter-acting parts, the tempo of activity within it depends largely upon public and private policies. Each component part of this economic structure is influenced by the general activity as well as by the activity within each other component part and each part is closely interrelated with the others. At varying levels of economic activity we have found that we can determine a relationship between national income and some significant component part of the economy, and thus, to a limited degree, we can measure the effect of various changes in national income on the segment in question.

In relating building activity to national income, we find that during the twenties and the thirties housebuilding fluctuated from a high of over 7% in 1925 to a low of 1.4% in 1933. These estimates include expenditures for new farm and urban houses, repairs, alterations, and miscellaneous construction. The average relationship over a complete building cycle (1919-1935) was 4.5%.

The year 1925 was the peak year in housebuilding. In that year housing contributed $5.4 billions to the national income. During 1925 there were 937,000 new non-farm dwellings built at a total cost of $4.5 billion. The remaining $0.9 billion was spent for other residential construction and repairs, alterations, etc.

TABLE 2.

NEW RESIDENTIAL NON-FARM CONSTRUCTION

Year	New Construction 000,000	Disposable income 000,000,000	Ratio of Construction to income Per Cent	Total Number of Dwellings
1925	$4,475	$74.8	5.98	937,000
1926	4,112	76.9	5.35	849,000
1927	3,910	76.4	5.12	810,000
1928	3,613	80.2	4.50	753,000
1929	2,453	79.6	3.08	506,000
Totals	$18,563	$387.9		3,855,000
Average for 1925-1929:	$3,712	$77.5	4.79	771,000[a]
1935	$754	$56.3	1.34	221,000
1936	1,267	65.2	1.94	319,000
1937	1,382	69.2	2.00	336,000
1938	1,584	62.9	2.52	406,000
1939	1,948	67.7	2.88	515,000
1940	2,276	73.2	3.11	600,000
Totals	$9,211	$394.5		2,397,000
Average for 1935-1940:	$1,535	$65.5	2.34	399,000[b]

[a]—Average Price $4,815.
[b]—Average Price $3,842.
SOURCE: Bureau of Labor Statistics and Department of Commerce.

In Table 2, constructed from data obtained from the Bureau of Labor Statistics and the Department of Commerce, it may be seen that the average percentage of disposable income—that is, national income less tax payments—spent for new non-farm residential construction during the period 1925-1929 was 4.79% and that during the period 1935-1940 it was 2.34%. New non-farm residential construction expenditures during the high period, 1925-1929, ranged from 5.98% in 1925 to 3.08% in 1929, and during the low period, 1935-1940, from 3.11% in 1940 to 1.34% in 1935.

On examining the activity which occurred in the residential construction market during these two periods, 1925-1929 and 1935-1940, it appears that during the first period its volume was too great to be long sustained and that during the second period its volume was too little to support adequately an active economy. The average percentage of disposable income spent on new non-farm residential construction during these two periods combined was slightly over 3.5%. It seems therefore that a satisfactory postwar level of expenditures on new non-farm residential construction should be slightly higher than this combined average of 3.5% and somewhat less than 4.0%. As a compromise, let us assume that 3.75% would be a satisfactory amount.

The first year of fully sustained activity after the war will generate a national income of $120,000,000,000 based on 1940 prices. Tax withdrawals will amount to $20,000,000,000, leaving a spendable income of $100,000,000,000. With 3.75% of this going into new non-farm residential construction, there will be $3,750,000,000 spent in this way each year.

From the Department of Commerce's figures, cited above, we determined that about 25% of the amount spent annually on new non-farm residential construction was for repair, maintenance, and upkeep. But we have been faced with unusual conditions for the past few years. Consequently, there has been little or no repair or maintenance work done on existing homes because materials or labor or both have been scarce, or prices have been so high that owners refused to have even necessary work done. As a result, properties have continued to deteriorate and a backlog of repair and maintenance work has been built up which will last several years. It is realistic to assume that for a few years this will be at least 30% as great as the amount

spent for new non-farm residential construction.

With a national income of $120,000,000,000, expenditures of $3,750,000,000 for new non-farm residential construction, and $1,125,000,000 for repair and maintenance, the grand total for non-farm residential construction will reach $4,875,000,000.

But the point in which we are interested is, what kind of new houses will the $3,750,000,000 build and how many of each?

The distribution of the postwar $120,000,000,000 national income will largely determine the spending pattern which will be followed by the 135,000,000 consumers who will dispose of it. Increased as it will be by $40,000,000,000 over the peak pre-war year, 1929, we cannot logically believe that this income will be distributed on the pattern of lower pre-war incomes. As incomes rise, a larger proportionate share of the increase normally goes to the lower half of the income scale; therefore, it seems reasonable to believe that the lower income groups will get a larger share of the $120,000,000,000 than they received of the $60,000,000,000 national income in 1935-1936.

In the last analysis, the exact distribution pattern of these postwar billions will depend upon public and private economic policies. However, as a reasonable hypothesis, we may accept the National Resources Planning Board's study of the distribution of $120,000,000,000 national income, moved 5% toward equality, as compared with the distribution of the $60,000,000,000 national income we received in 1935-1936. (See Table 3 and Figure 1.)

The NRPB in its study, "Family Expenditures in the United States," June 1941, showed a distribution of families by income class levels and the amount of rent each income group averaged for the year 1935-1936. It is quite generally accepted that a family can afford to pay in rent only about 1% a month of the purchase price of the home. Therefore, if a family can afford to pay only $20.00 a month rent, then, that family cannot afford to purchase a home which will cost more than $2,000.

TABLE 3.

HYPOTHETICAL DISTRIBUTION OF $120,000,000,000 NATIONAL INCOME

Income Class	Per Cent of Families
0 — 500	4.1
500 — 750	6.3
750 — 1,000	8.6
1,000 — 1,250	6.5
1,250 — 1,500	10.4
1,500 — 1,750	8.5
1,750 — 2,000	8.3
2,000 — 2,500	11.6
2,500 — 3,000	10.3
3,000 — 4,000	11.5
4,000 — 5,000	6.2
5,000 — 10,000	5.4
10,000 — 15,000	.9
15,000 — 20,000	.6
20,000 — over	.8

SOURCE: Studies in Wartime Planning, a Publication of National Resources Planning Board, August, 1942.

From the National Resources Planning Board's study, "Family Expenditures in the United States," June 1941, we found that, in the 1935-1936 spending pattern, a family with $1,250 a year income paid on the average $20.00 a month rent. If we are to assume that the same relationship will apply to family income and rent-outgo for the postwar income distribution as applied to the 1935-1936 distribution, we will find that there will be 25.5% of the families in the hypothetical postwar distribution who will be earning less than $1,250 a year and who are unable to pay as much as $20.00 a month rent and thus unable to afford a house which will cost as much as $2,000. If we assume that the cheapest house on the postwar market will sell for $2,000, we shall have to delete from our potential postwar market for new homes those 25.5% of families whose incomes will be less than $1,250 a year.

The distribution of the remaining 74.5% of families who will be able to afford new homes is shown in Table 4.

TABLE 4.

DISTRIBUTION OF POTENTIAL NEW HOME OWNERS BY INCOME CLASSES

Income Class	Per Cent of Families
$1,250 — $1,500	13.95
1,500 — 1,750	11.41
1,750 — 2,000	11.14
2,000 — 2,500	15.57
2,500 — 3,000	13.83
3,000 — 4,000	15.43
4,000 — 5,000	8.32
5,000 — 10,000	7.25
10,000 — 15,000	1.21
15,000 — 20,000	.82
20,000 — over	1.07
	100.00

In continuing our estimate, we must now determine how many houses will be bought at various price levels with the $3,750,000,000 which we have calculated will be spent annually on new non-farm residential construction. There are many conflicting estimates of the number of new non-farm homes that will be built each year for the next ten years. It is possible to rationalize almost any position one cares to take on this subject. Let us assume—indefensively, maybe—that we can and will build 1,000,000 new homes a year for a few years after the war, possibly for 10 years. On the basis of family income distributions as shown in Table 4 these homes should fall into the price classes shown in Table 5.

TABLE 5.

HYPOTHETICAL DISTRIBUTION OF ONE MILLION NEW HOMES

Income Class	Per Cent of Families	Value of Home	Number of Homes	Aggregate Value
$1,250 — $1,500	13.95	$2,000	139,500	$279,000,000
1,500 — 1,750	11.41	2,250	114,100	256,725,000
1,750 — 2,000	11.14	2,500	111,400	278,500,000
2,000 — 2,500	15.57	3,000	155,700	467,100,000
2,500 — 3,000	13.83	3,500	138,300	484,050,000
3,000 — 4,000	15.43	4,000	154,300	613,200,000
4,000 — 5,000	8.32	5,000	83,200	416,000,000
5,000 — 10,000	7.25	6,750	72,500	489,375,000
10,000 — 15,000	1.21	10,000	12,100	121,000,000
15,000 — 20,000	.82	13,500	8,200	110,700,000
20,000 — over	1.07	20,000	10,700	214,000,000
TOTALS	100.00	*($ 3,730)	1,000,000	$3,750,000,000

* AVERAGE VALUE.

For the past several years we have had the largest national income we have ever known. This larger income has been paid out to a larger working force and those in the lower half of the income scale have received a far larger proportionate share than they have ever had before.

As a result of the war and the scarcity of commodities, the workers have been accumulating surplus savings at an unprecedentedly faster rate, and a goodly share of the $100,000,000,000 of accumulated savings is in the hands of families heretofore known as the underprivileged third. When commodities are again available, these families will possess accumulated savings enough for down-payments on new homes. They will be most anxious to buy if the price of new homes is low enough to attract them.

However, for the present, there will not be any new homes available for these over-eager newly rich who, unaccustomed to surplus funds, will be quick to reduce

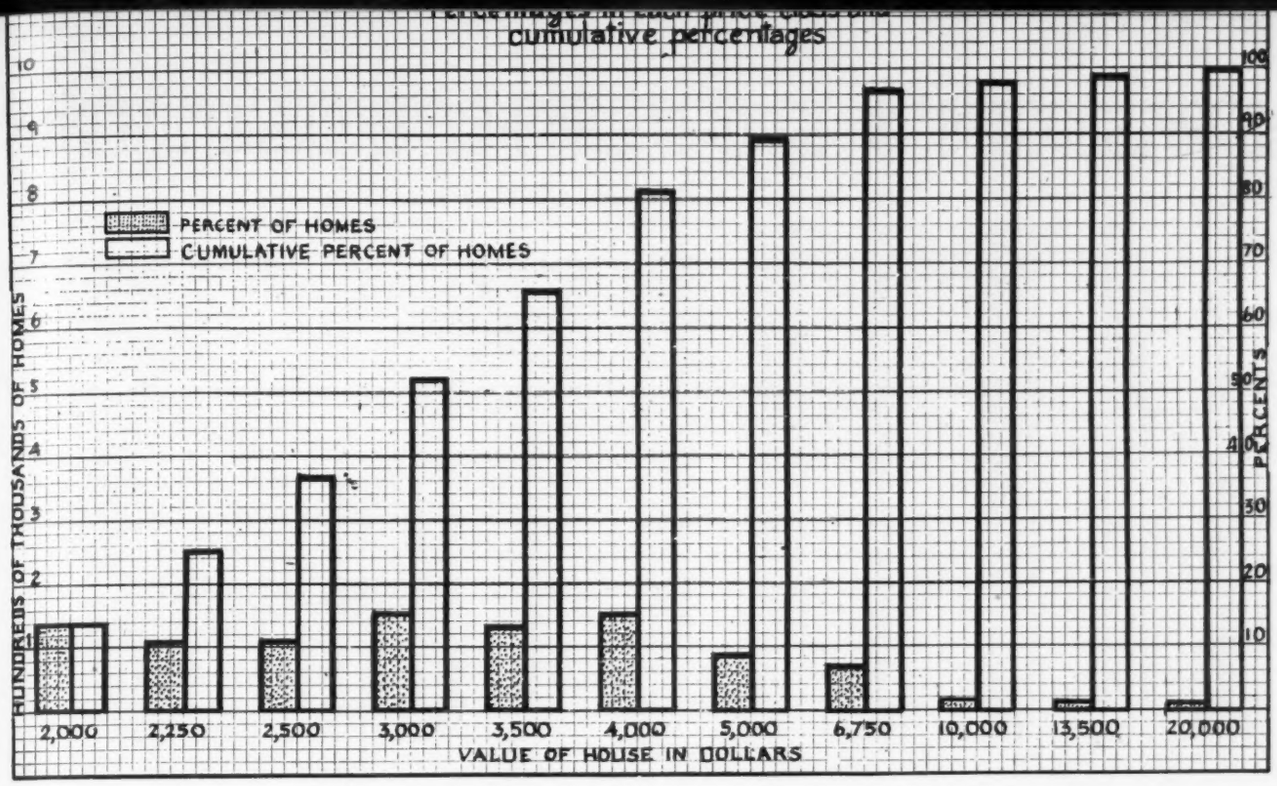


Fig. 2. The First Million Postwar Homes.

their creditor class status.

The housebuilding industy has been shot to pieces except for that which is employed on war housing work. It will, therefore, be at least 18 months before it will be reorganized sufficiently to handle a volume approaching 1,000,000 new homes a year. Traditionally, better than 95% of the building contractors are small operators who have little or no capitalization. These have largely disappeared from the construction field since the beginning of the war; the mechanics formerly employed by them have sought work in other fields, notably shipbuilding. It is obvious that the housebuilding industry will have to be reconstituted and reorganized.

While great numbers of small operators have been liquidated by the war, new organizations have been formed which have learned a great deal about the use of mass production methods in the building of houses. Many of them have made a great deal of money on war housing, and now have the means of financing to enable them to undertake work on large scale housebuilding projects. Situated so favorably, it will not take them long to reorganize.

One additional snarl, however, confronts the industry. It now appears that the building materials section will be in a particularly bad position as to inventories, with the lumber industry worse off than any other. The lumber industry normally holds in inventories about 17 billion board feet. Today these are down under 6 billion board feet. Logging mills will, naturally, not be able to get men to return to the woods and cut logs as long as the manpower shortage exists and as long as defense industries pay wages beyond the reach of the lumber industry. With the relaxing of shipping restrictions, this shortage on the Atlantic Seaboard may be remedied by shipments of lumber from Sweden, Finland, Holland, and Norway, which will be eager to get dollar exchange as soon as possible and whose lumber will find a ready market.

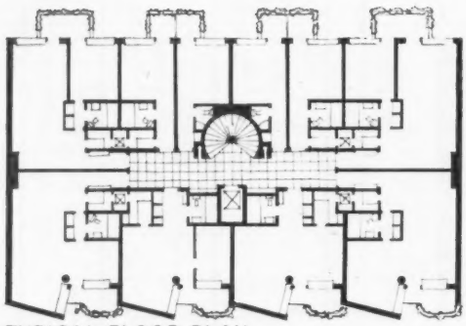
As it will be difficult to hold building material prices in check after price ceilings have been removed, the existing low level of inventories in building materials and the pressing demand for them will no doubt bring about a price inflation which will last until supplies again become large enough to restore competition. Such a price inflation will scare the low-cost home owner out of the market and will limit production of housebuilding to the custom-built market—the 10.35% earning $6,750 and over—and to repair and maintenance. It will be safe to assume that this condition will exist for at least a year and a half.

If we are to reach our goal of 1,000,000 new homes a year at a total expenditure of $3,750,000,000, almost 90% of these new homes will have to be built for $5,000 or less. Also, if adequate housing is to be built for $2,000 or $2,250—which must be the case if the proposed schedules are to be realized—it will have to be built by either the large site fabricator or by the prefabricator, and it will have to be erected on land which can be purchased cheaply and land to which utilities can be conveniently and inexpensively brought.

But organized labor has had a deep seated hatred of prefabrication and has refused to work on jobs where any prefabricated parts have been used. The building-labor unions have even gone so far as to prevent management from combining crafts to eliminate overlapping functions and thus do away with waste and reduce costs. The pressure of war, however, has tended to modify labor's attitude. A.F.L. workers have not only installed C.I.O. prefabricated parts, but have been employed in prefabricating factories on shop-installed wiring and shop-installed plumbing. In some of the large defense housing projects, A.F.L. unions have accepted prefabrication in on-site shops. They have even recently begun to organize prefabricating plants, thus recognizing the need of modifying their rigid craft union concepts.

The obstacles to low-cost housing seem almost insuperable and they seem to far outweigh the favorable forces. However, the need for low-cost housing is so great it can be fairly said that at least the minimum demands will be met. The public has been lead to believe that low-cost housing is its rightful inheritance and it is going to demand the removal of any and all obstacles that stand in the way.

SWEDEN'S HOUSING SOLUTION



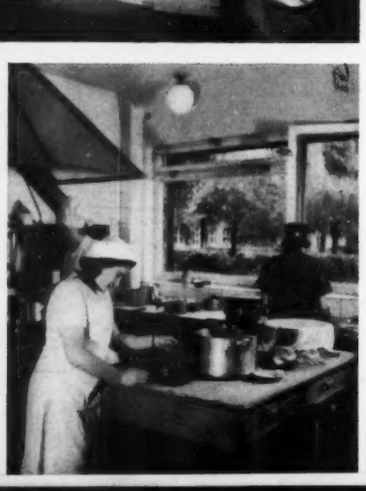
TYPICAL FLOOR PLAN

FIRST FLOOR PLAN

Photographs by courtesy of American-Swedish News Exchange

1. Kollektivhuset in Stockholm, 1935

SVEN MARKELIUS, ARCHITECT

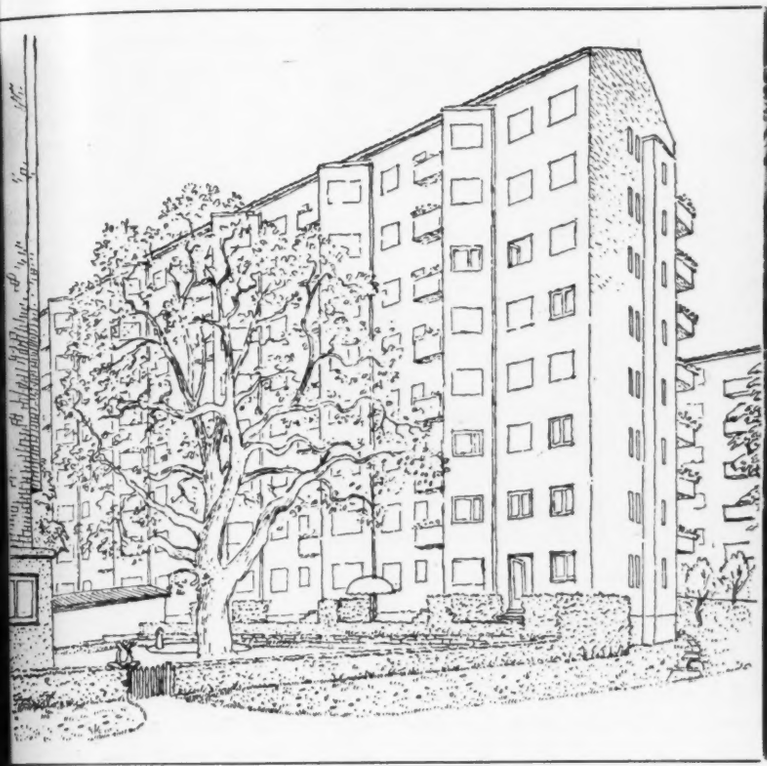


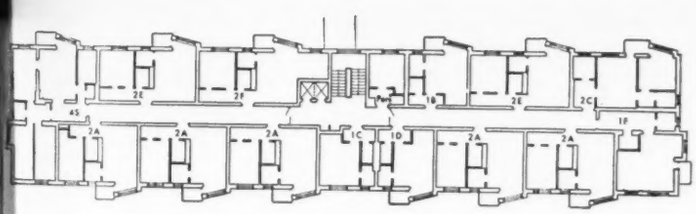
This "collective house," built in 1935, set the pattern for later projects based on the same general idea—to provide attractive, economical housing for Sweden's young families in which, through collective services, the waste and burdensomeness of housekeeping for the small modern home are eliminated, the servant problem solved, woman's energies and intelligence freed for more important tasks.

On the ground floor plan (above) are a restaurant, a central kitchen, and a day home for children. Meals can be served through dumb-waiters from the main kitchen to the individual apartments.

2. Kollektivhuset Marieberg, 1944

SVEN IVAR LIND, ARCHITECT: OLLE ENGKVIST, BUILDER





Stockholm's latest collective house, completed late in 1944, puts even stronger accent on families. Over four-fifths of the occupants are young couples. A recent poll showed 90,000 families waiting to move into just such apartments.

Discussion by G. Howard Smith

Sweden has a way of continually giving indications of things to come. Few in number, Swedes have had to be alert and hardworking to maintain their position in world competition, and in the process have developed a highly competitive spirit among themselves. Consequently Sweden always gives the impression of being of tomorrow rather than of today, and not least in the forms modern living has taken there. Arrangements for living which are appearing in Sweden today may well set the pattern elsewhere in coming decades.

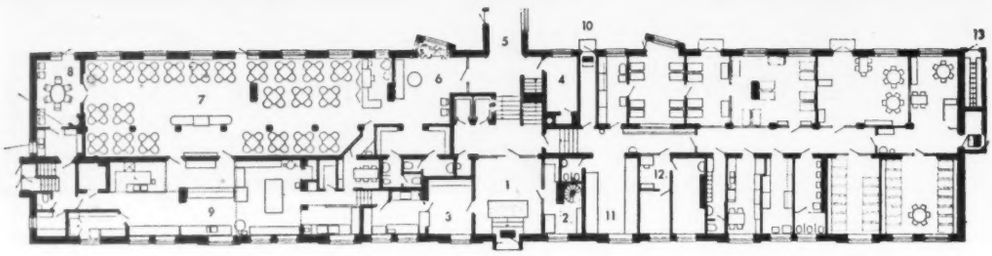
Full employment is nothing new in Sweden. Even before wartime mobilization and intensified rearming made conditions there very similar to those in countries actually at war, the accent had been on people rather than on jobs. Thus, women have found opportunities for work as readily as men, and literally every unmarried girl in Sweden has a job, whether she needs it or not. The tendency, too, is for women to keep their jobs even after marriage. Just keeping house gives too little scope. There is therefore an evident demand for arrangements by which women with jobs, whether married or single, may be relieved of the cares of housework and yet have a real home life.

Sweden's solution has been the so-called "collective house." This is an apartment house, run like a club, with a central kitchen, cleaning and laundry services, and child care facilities. Although one of its objects is to provide a solution of the housekeeping problem for bachelors of either sex who have a career to attend to, the main social demand it meets is that of the young family. While it is not unknown in Sweden that young couples have founded families even when both partners are still studying at the university, it does take a man much longer today than formerly to establish himself economically, and if he marries young the wife must often go on working if they are to maintain anything like their accustomed standard.

Markelius' Kollektivhus

The first collective house was built in Stockholm in 1935, at the initiative of Sven Markelius, the brilliant designer of the Swedish pavilion at the New York World's Fair. He was also the architect of this building, which has always been known simply as Kollektivhuset—*the* Collective House. The beginning thus made was comparatively modest, but it set the pattern. It contains 55 apartments, on six floors, 16 being of one room, 18 one-and-a-half rooms, 16 two-rooms, 1 three-room, with 4 four-room atelier apartments in the top story. All the apartments have balconies. The house is the second in a street leading away from the open water of Malaren, and the facade is built sawtoothwise to give all the street-side apartments a view of the lake through large, unobstructed windows. The other apartments look onto a pleasant garden inside the block.

On the street floor are a restaurant, the central kitchen, and a day home for the children. The restaurant, open to the general public, is popular in the neighborhood. Meals can be served to most of the apartments directly from the kitchen by means of four dumb-waiters. Dishes are supplied from the kitchen and returned there for washing. Each apartment, except for a few one-roomers, includes a



Tenant convenience is the watchword at Marieberg. Approximately half the ground floor area of the entrance building is given to a kitchen and restaurant capable of serving 90-100 people at a time. (Meals can also be taken to apartments in specially fitted boxes.)

The other half of the plan accommodates the well-appointed day nursery. A porter's lodge inside the entrance receives packages for tenants. In the rear building half-basement is a common laundry. This feature is also open to the general public. Tenants get a discount. There is also a small laundry for use by individuals and each apartment bathroom has a tub for clothes as well as a handbowl.

kitchenette with a gas stove, stainless steel sink, and refrigerator. At the entrance to each are garbage and laundry chutes.

All service in the building is channeled through the central kitchen: orders for meals, cleaning help, etc., are received there through the house telephone, bills are written out, and food is served not only to the apartments and restaurant, but also to the day nursery. Cleaning service costs 25 cents an hour; meals, 40 cents for lunch, 45 for dinner. By buying meal tickets in advance, tenants can even obtain a 25 percent rebate. A staff of about 20 persons under a manageress performs all the service needed.

The day nursery, where children may be left from 8 to 18 o'clock, is a department to itself, with a trained staff. The children are divided into age groups, with a separate section for babies, and a small isolation room for children with colds. Toys and other play equipment are provided, and there is ample outdoor play space in the planted area onto which the nursery looks. If parents go out for the evening, children can be left for the night at the nursery, or they can be watched in the apartment.

None of the services at Kollektivhuset are obligatory. In some Swedish collective apartments tenants must contract, for instance, to take a certain number of meals each month. That this has not been necessary at Kollektivhuset is probably because restaurants are scarce in its vicinity and there is a large potential clientele from other apartment houses.

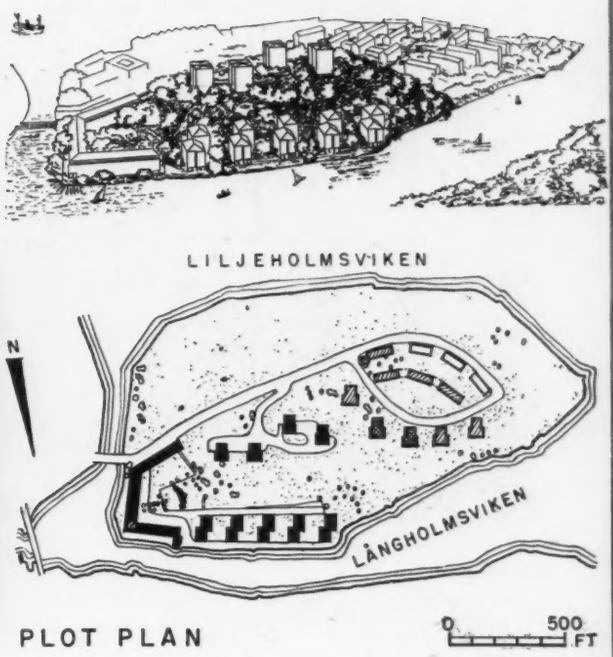
Kollektivhuset was built by a private group, organized as a "dwelling-right society." This owner-financing method of apartment house construction is fairly common in Sweden, being in fact the basis of the cooperative housing movement: prospective tenants form a building society and supply initial capital by paying down 10 percent on the value of the apartment they intend to occupy, thereafter enjoying much lower rent than would be charged in a speculatively financed building. As an example, the initial payment on the three-room apartment in Kollektivhuset was 2,330 kronor; the yearly rent is only 2,219 kr. (2,000 kr. = $500), about a third less than the corresponding rate in a non-cooperative building.

The building cost of Kolliktivhuset (1935) was around $212,500, including $31,250 for the site. In addition to the 10 percent paid by the tenants, and a loan of $31,875 from the State Building Loan Bureau, finance was provided by the builders, Gumpel & Bengtsson, on a ten year amortization basis.

In ten years, 32 children have been born to tenants of Kollektivhuset. The divorce rate has been extremely low—only two cases. Only 45 tenants have moved out so far: marriages of occupants of the smaller apartments or families outgrowing their quarters are practically the only causes. Family incomes range between 5,000 and 20,000 kronor, few exceeding this. Present occupants include 15 couples (7 with one child, 4 with two, 1 with three, 3 childless), and 36 bachelors. Perhaps the best

3. Reimersholme; 1944

DESIGNED BY HSB ARCHITECTS



Reimersholme has an advantage over most apartment developments in the park-like character of its island site, with its great expanse of natural play space.

recommendation for Kollektivhuset is the fact that the architect still lives there with his family.

Kollektivhuset Marieberg

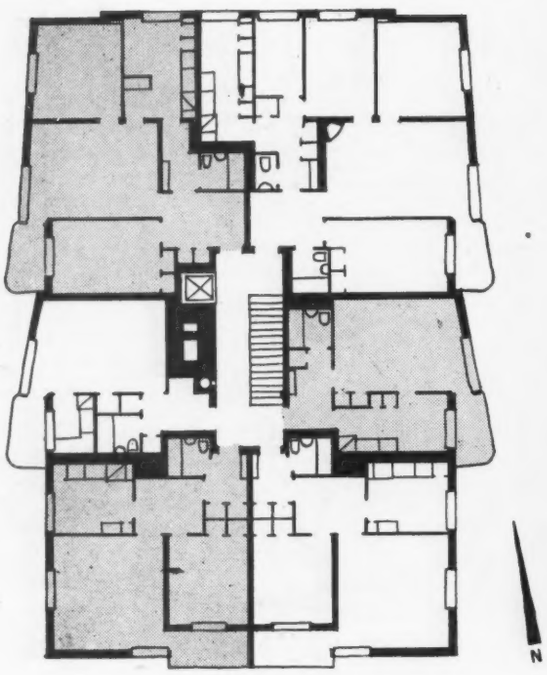
The Marieberg apartments are across the Malar lake from the original Kollektivhuset, near the southern approach to the huge gracefully-spanned West Bridge, Vasterbron. They consist of two parallel eight-story houses, joined by a covered passageway. One-room apartments in this new complex are in a minority, only 43 out of 197. There are 121 two-room, 15 three-room, and 6 four-room apartments. Relative numbers of the various types were determined after extensive investigations and consumer research. Rents for the one-room apartments are about 1,000 kr., 2 rooms from 1,600, 3 rooms from 2,500, and 4 rooms from 3,500 kronor. These rents do not include heating: the present precarious fuel situation makes it practically impossible to calculate costs within any reasonable margin.

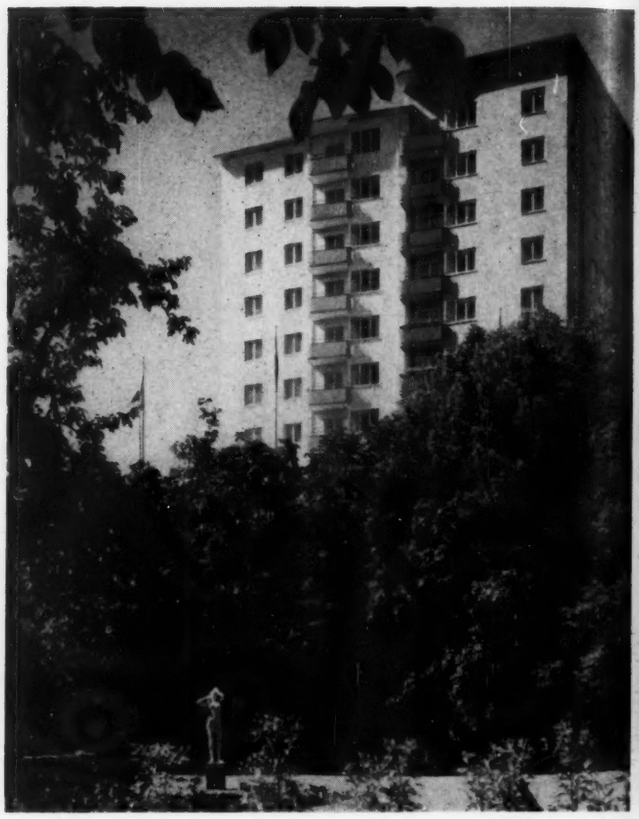
Kollektivhuset Marieberg was built and is owned by a specially formed, non-profit company which pays a limited dividend, thus qualifying like municipal housing for government building loans. The leading figure is the prominent Stockholm builder, Olle Engkvist.

About two hundred apartments are required to make such an enterprise self-supporting, according to Mr. Engkvist. To plan a collective house for family living is particularly hard, as there are so many unknown factors and little experience as yet to draw on. Apart from the original Kollektivhuset, most of the projects with communal services have been for single women, and it is planning of the services for families that gives the difficulties. One cannot foretell, for instance, how large the families will be, and whether they will keep their apartments as the children grow up, or yield them to younger families. This makes it difficult to plan economically for the day nursery. It is also hard to know how many people will use the restaurant and how many will want meals in their apartments; but here the assumed ratio of 75:25 proved very close. Engkvist wants to build more similar houses.

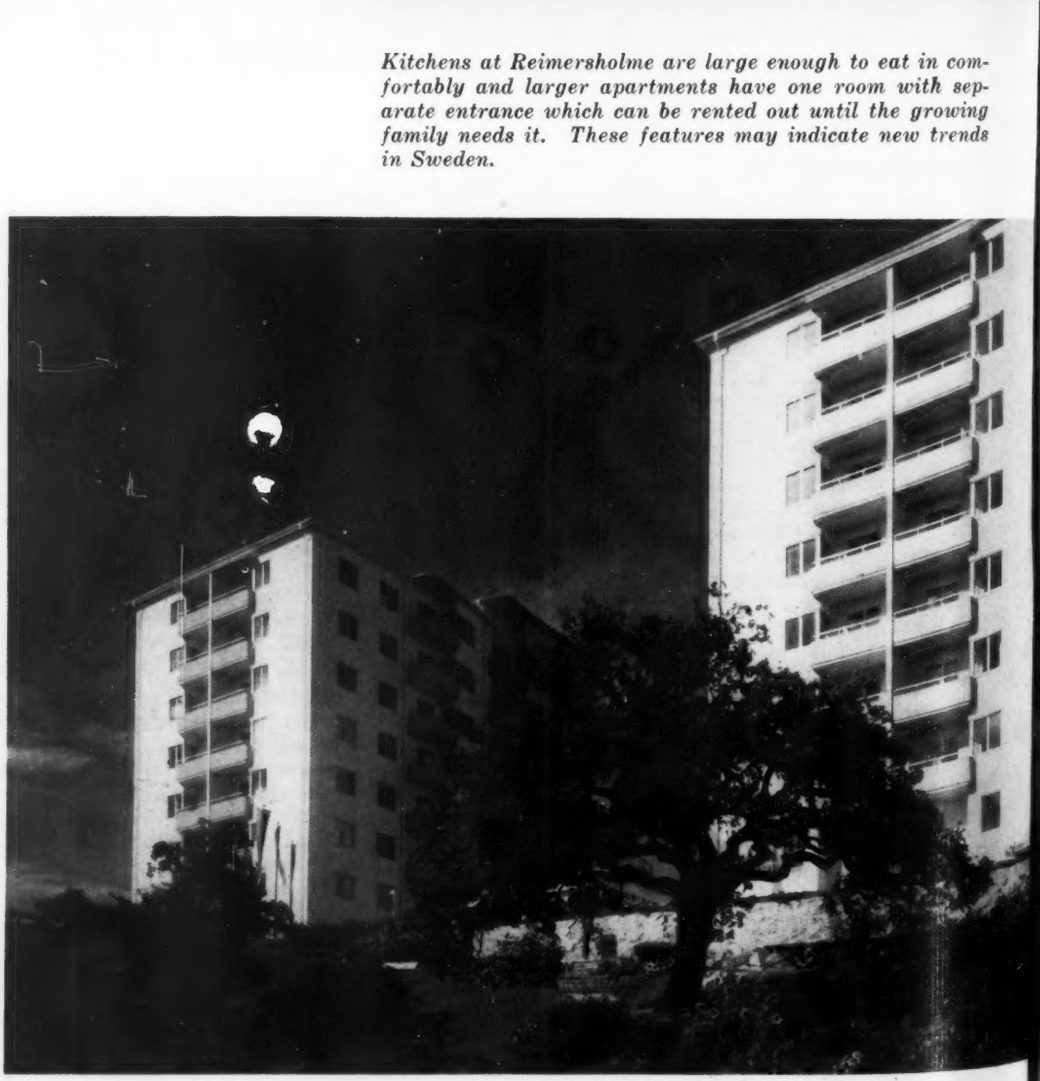
Great thoughtfulness in planning for convenience is evidenced in the Marieberg houses. Dumb-waiters are omitted here because of expense and difficult installation in larger buildings. Otherwise the kitchenette equipment is similar to that at Kollektivhuset, except that stoves are electric. Tenants must pay for 25 dinners a month, at a cost of about $9.50. Hire of food boxes costs ten kronor ($2.50) a year and dishes must be returned washed. Private dinner parties may be held in a smaller room off the main restaurant.

On the nursery side is a baby carriage "garage" entered direct from the garden. As at Kollektivhuset the nursery is divided into sections for babies from 4 months, with sleeping space and dressing room, and playrooms and sleeping rooms for rompers and kindergarten agers. Immediately outside is an open air play space with a paddling pool. The charge per child is 2:65 kr. per day, about





Kitchens at Reimersholme are large enough to eat in comfortably and larger apartments have one room with separate entrance which can be rented out until the growing family needs it. These features may indicate new trends in Sweden.



65 cents, including two meals. The nursery has a staff of nine, including the supervisor and a trainee.

A cleaning woman lives on each floor of the building, and is hired privately by tenants. On each floor also is a cupboard with a trolley wagon for taking bedclothes up to the roof for beating and airing, and a house telephone connecting with the restaurant, laundry, and nursery. A woman manager is in charge of this collective house. Other amenities include a bicycle garage to each house, a hobby room for older children, attic storage space for each tenant, and food storage space in the cellar. Bomb-proof shelters are built into the basement.

The latest cooperative development: Reimersholme

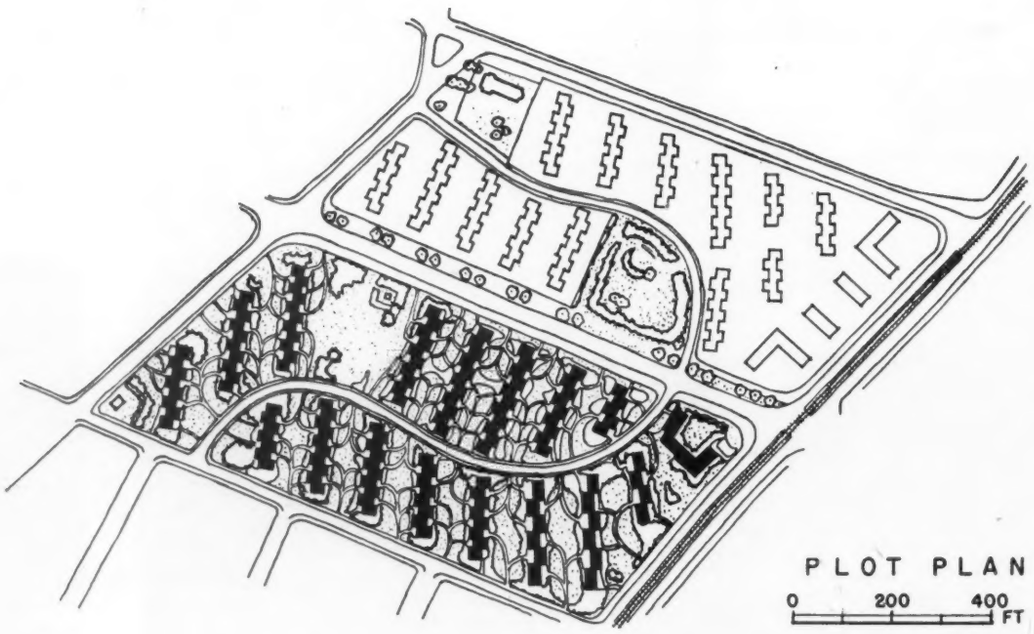
Several variants of the collective house idea have appeared, mostly in Stockholm, ranging from complete collective arrangements for single women to simple organization of cleaning help and watching of children in ordinary apartment houses. Occupying a middle position here is the extensive cooperative housing movement, HSB, which offers practically all the amenities of the collective house, except restaurant service. The most recent HSB building project is on one of Stockholm's smaller islands, Reimersholme.

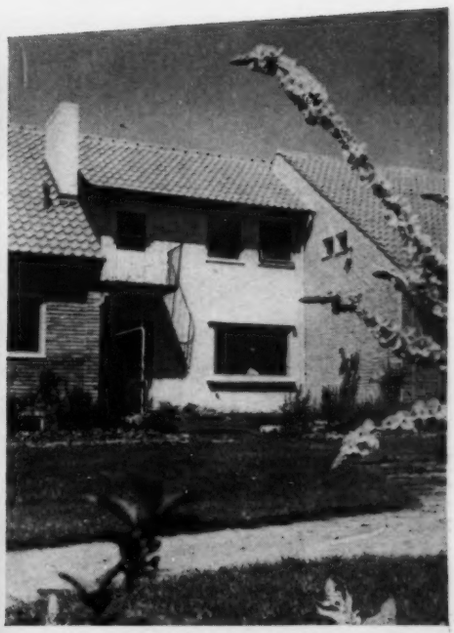
The opening of the Reimersholme project last August marked the completion of 20 years of activity by HSB, which is now the largest producer of dwellings in the country, with an annual building program of 100 million kronor ($25,000,000). HSB housing is now, in fact, the fourth largest city in Sweden. The name HSB, standing for Hyresgasternas Sparkasse och Byggnadsforening—Tenants' Savings Bank and Building Society—indicates its basic business. The mainspring is the National HSB Society in Stockholm, owned cooperatively by all the local societies formed where there is HSB building. The national society maintains a large designing office, owns prefabricated housing factories and lumber mills, and acts as a central purchasing agent. It helps local societies

Reimersholme makes harmonious use of certain existing 18th century buildings, notably Anders Reimer's old home (right) which is now entirely arranged for use by the project's children, who enjoy admirable play facilities.

4. Friluftstaden

ERIC SIGFRID PERSSON, ARCHITECT AND BUILDER





At Friluftstaden, by alternating row houses back to front and overlapping them, an outdoor "room without a roof" is added to each family's living space. There are no back doors, so complete privacy from immediate neighbors is attained. To meet them, one must go around the block.

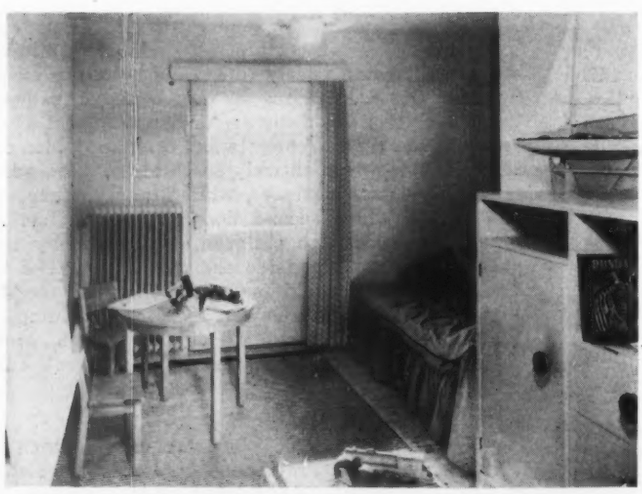
to arrange loans, and guides their activities. They, in turn, back the management foundations which are formed for each project, help to obtain sites, purchase supplies, and manage building operations. The local societies also do the accounting for the management foundations, handle the sale and exchange of apartments, and receive members' savings.

The management foundations are legally and economically independent with committees elected by the members, and the completed houses are turned over to them. The building credits then return to the national society, and regular financing is arranged on the finished building. Advance payments by tenants total ten or five percent of the value of the building, according to its classification, but tenants' investments are always subordinate to mortgages taken by outside agencies. First and second mortgages are usually through banks, insurance companies, or public credit agencies, while third mortgages consist of government or municipal loans or are taken by the national society. The annual payments by the tenants (corresponding to rent) must always be large enough to amortize a certain amount of the outside capital within a definite period, thus gradually increasing the tenants' own equity. These annual payments are reduced year by year until they become about half of the original amounts. The economies of the system lie in the elimination of speculative waste. It naturally appeals to the more orderly and established sections of society.

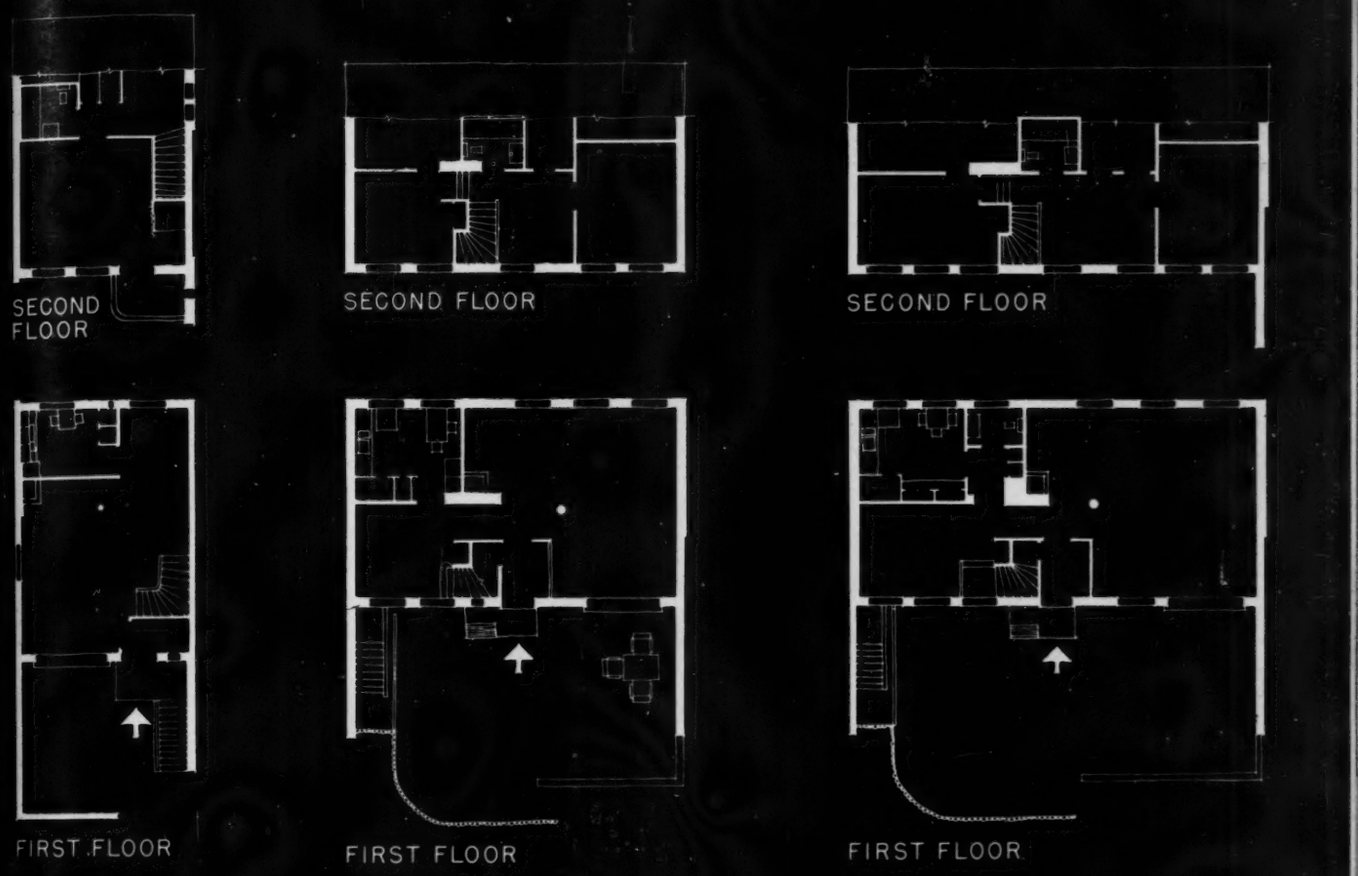
In Stockholm, especially since 1930, whole city sections have been developed by HSB. The architecture is in the practical Swedish modern manner, unfettered by ideas either of the past or of a hypothetical future. In the latest development on Reimersholme the design makes harmonious use of certain 18th century buildings along with the new and purely functional buildings on the island heights. Old Reimershus—manor house of Anders Reimer, hat maker and city father—forms the kernel of the development: the HSB architects had the happy idea of turning this old home over entirely to children. The ground floor is for babies and rompers, while kindergarteners have the run of the whole second floor. Provision has also been made for school age children, with a hobby room in a special building alongside the day home. The transition from the pleasant old manor to the high modern buildings is achieved by a lower U-shaped building, with the traditional broken roof of older Swedish architecture, forming a semi-enclosed court by the water's edge.

Friluftstaden

At Friluftstaden, "the open air city," which also was opened last August, in Malmo, capital of the rich southern province of Skane, the advantages of a private house and a collective apartment are ingeniously combined. Brilliantly simple in conception, it is quite as thorough in its attention to the practical details as the apartment house planning already described. Its originator, architect, and builder, Eric Sigfrid Persson, like Stockholm's Olle Engkvist, started life as a bricklayer. As with many successful Swedes today, neither Persson nor Engkvist is a man of the city. This is perhaps significant, for the fact that the overwhelming majority of people in Sweden have grown up in steady contact with the natural beauties of the countryside explains in great measure why the modern movement in architecture, with its inherent revolt against the big city—"the city of stones," as Persson significantly calls it—has had such an immediate and widespread appeal for them.



The Swedes are skilful in making use of relatively smaller space in their living quarters than we are accustomed to in America. Even the largest of several types of plans at Friluftstaden is still a "small house." Yet with light portable furniture and colorful fabrics the tenants make their homes seem commodious and cheerful.



Persson's basic idea in Friluftstaden was to create housing in which there is the most intimate contact with the earth and the open air. By using his own patent "Perspektiv" windows, which allow wide unobstructed vision, he has given a feeling of the open air even within doors. Also, an open air "room without a roof" adjoining each family's living room is provided simply by building one-and-a-half-story houses alternately back to front in rows of 8 or 10. A private and protected little courtyard in front of each is thus formed by the projecting back portions of its neighbors.

Persson's second aim in planning Friluftstaden was a rationalization of suburban housekeeping in line with that of city apartments. He was impressed by the fact that the suburban housewife, all over the world, was still little more than a better class servant—despite all much advertised labor-saving apparatus—with little or no opportunity for personal development outside the household. He has therefore arranged centralized services for the whole estate: heating, garbage disposal, care of the common grounds, laundry, day nursery, and domestic help being thus provided or available to the tenants. Here it may be mentioned that the back door was abolished because investigations showed that it was used 95 percent for carrying out garbage. Garbage is therefore taken care of more economically through a chute over the kitchen sink, with a straight drop down into a garbage can concealed in the wall of the cellar entrance, whence it is collected daily and consumed in the central heating furnace. Other details all follow this idea of reducing housework.

Economy is achieved throughout to an astounding degree. This not only applies to rents—even the largest dwelling is only $600 a year—but also to the city plan. The simple effectiveness of the gently curving service roads, together with the complete exclusion of traffic between house rows, has made it possible to keep the length of road with drainage mains down to about 1,000 yards. The conventional suburban block manner would have required for this estate two-and-a-half times as much roadage, and twice the length of drainage mains and would have cost the city 463,900 kronor as against the 130,000 kronor Persson's planning has actually cost it. Likewise the estate's garbage disposal system saves the city 61,000 kr. a year.

Friluftstaden, if laid out conventionally, would have accommodated only 115 families, instead of 250 as now. And all is arranged to facilitate enjoyment of leisure life: not only is housework kept to a minimum, but also by providing just as much private garden space as each family can easily look after, leaving the big expanses of garden commons to be cared for by the estate staff, another of the great burdens of suburban life is lifted from the householder's shoulders. Yet all the pleasantnesses of out-of-town living remain. It has even been calculated that the adult inhabitant of Friluftstaden can spend 1,600 hours annually in the open air as compared with 940 elsewhere —and can spend them at leisure, instead of shopping, traveling, etc., as others must. Children are even more favored, with 2,400 possible hours in the fresh air as against 1,300 in other circumstances. Something to think about, it would seem.

Photographs by Roger Sturtevant

House in Northern California

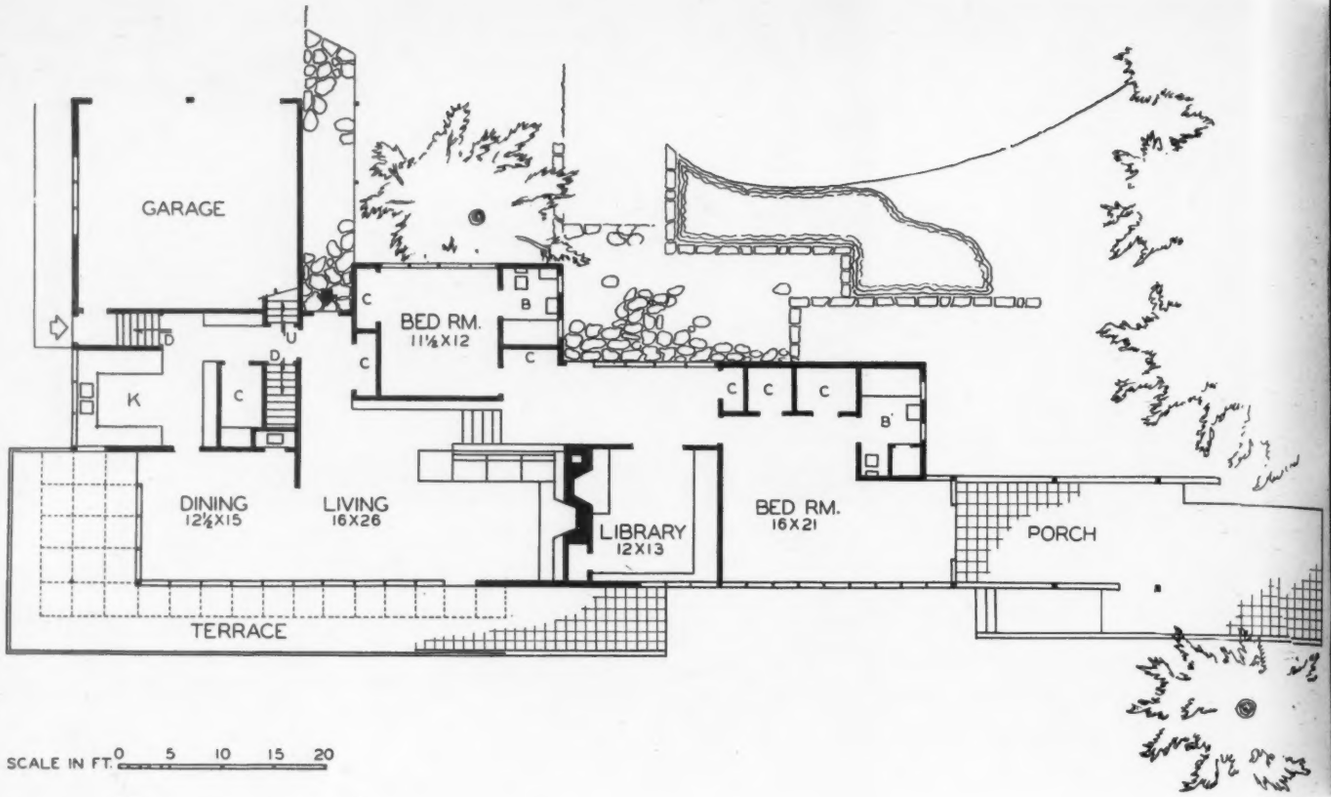
BY JOHN B. YEON

The concept of a house as merely a machine for living or as a family shelter fitted with all conveniences falls somewhat short of completeness if it aims to describe a home for civilized and cultured people. The California residence presented here goes far beyond such minimal ideas and provides comfort for the soul as well as for the body. Such a satisfactory result was not accidental. It arose, we are sure, out of a serious and sympathetic search for form by a sensitive designer who looked beyond the physical needs of his clients and saw that the site could be made to yield them a distinguished and fitting environment. Out of wholly indigenous materials, assembled with care and intelligence, he wrought so naturally that the house seems almost to have grown rather than to have been built there.

The plan needs no functional analysis. It helps rather than hinders the free flow of servantless daily life that moves within and around it. Beyond that practical end, however, there are many studied subtleties of space which reward the perceptive observer, be he visitor or occupant. The interpenetrating rectangles of dining room, living room, and gallery make possible an infinite variety of effects as one moves about, even in imagination: calculated shifts of proportion, color areas and combinations suggest a sort of Calder Mobile in reverse, in which you are the moving part. Such considered relationships were applied on the exterior also, bringing a sense of ever-changing form and color to the design which can be felt even in the series of black-and-white photographs shown here. For lasting satisfaction, architecture should be designed thus, with thought for its enjoyment as well as for its use.

The location affords a view toward the west across farmlands, past wooded hills, to a distant arm of the sea. Just above the house, on the crest of the hill to the northeast, lies a garden in the midst of a redwood grove. Lawn area is concentrated here and the planting consists exclusively of flowers, shrubs, and ground covers, all native to this botanically rich region. On the south side a dome-shaped meadow sweeps unbroken to the walls of the house.

Built in 1941, just below the crest of a hill in the redwood region, this house possesses the quality of being precisely molded to its site as well as to the needs of its owners. The imaginative designer, who has an unusual sense of appropriate color and form, has created out of ordinary stock materials—the standard products of local mills—an extremely thoughtfully-planned ensemble, romantically in tune with surrounding nature.



Flush redwood siding, become silvery under the weather, is the principal exterior material, with painted doors and interior window members providing bits of color accent. The south elevation exploits the length of the house by horizontal emphasis of unbroken eave line, trellis, deck, and window bands—an emphasis in counterplay to the towering trees around it. The rise in the roof ridge and the increase of wall area as the grade declines impart a sense of movement to the composition.

Except for the foundation and chimney, the house is entirely of wood. It was site-constructed out of stock products of local lumber mills and was designed, with this condition in view, to require a minimum of special cuts. For example, window and door openings and breaks in the foundation were all calculated to coincide with the joints in the flush siding. These niceties called for more forethought and work on the part of the designer but made for more complete visual satisfaction and better articulation.

Nothing more special than a quarter round was used and no millwork except flush doors. Baths, kitchen, closet-facings, and living room wing-wall were finished in plywood—library and master bedroom in clear pine. The rest of the house is finished in redwood. Framing also is redwood, while floors are oak. In all rooms, painted surfaces of doors, window members, closet fronts, and cabinets permit color contrasts and harmonies with the large natural-finish wood surfaces. These schemes can, if desired, be changed from time to time.

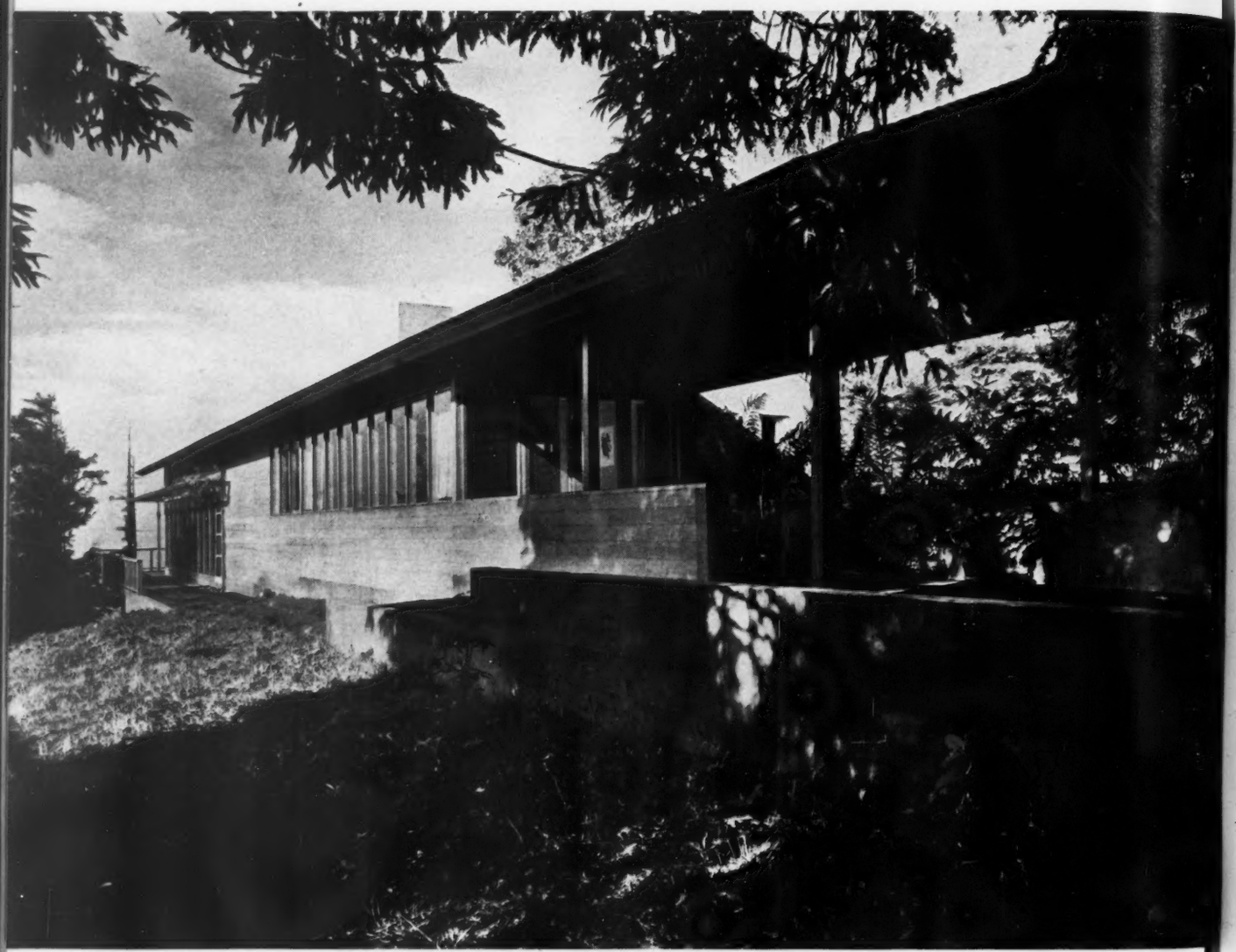
The construction is the old balloon frame with its ribs exposed in the window areas. Some very common lumber products were employed with an occasional difference. Redwood vertical-grain flooring was used on the walls of the main room and in the guest bedroom, where two thicknesses, with meshing tongue-and-groove, easily achieved a slight raised-panel whimsey on the ceiling and down one wall. Standard and hackneyed ceiling material formed the main room ceiling. All the pieces were of identical length and had their ends beveled to match the side V. By staggering the joints a faint pattern was obtained which echoed the shape of the room. No plaster was applied anywhere.

By the use of fixed glass for daylighting and screened louvers for ventilation everywhere but in the kitchen and bathrooms, construction and insulation are simplified, maintenance reduced, and ample water-tight fenestration made possible even in a situation exposed, as this one is, to severe storms. Curtains may be drawn without obstructing ventilation and without risk of damage from wind or rain. Screens are out of the way, where they do not interfere with the view. A house so treated can also be ventilated during absence of the owners without facilitating entry by burglars or curious prowlers.

Experience of the owners with this house has shown the need of some means of controlling the quantity of sun entering the living room in winter. Shades will take care of this. In summer there is no problem, for the designer had provided an automatic seasonal awning in the form of a deciduous vine to grow on the sunshade trellis above the southern and western windows. Since it is commonly foggy in summer anyway, however, Mr. Yeon whimsically suggests that a workable solution might lie in the discovery and substitution of some strange species of creeper that bears leaves only in winter!

K. R.

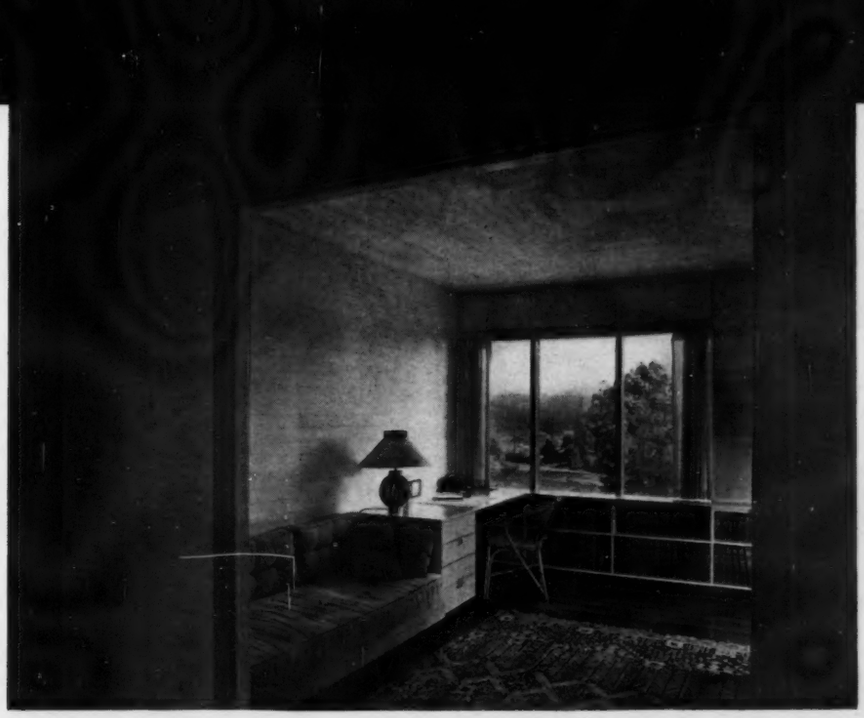
On the outside, the designer sought to achieve "a long lithe form emerging from the woods, gliding across the dome-shaped meadow toward the open view at which it is aimed." The dominant exterior material is redwood, bleached and weathered to a delicate and subtle gray which fits naturally into the landscape. The plan is composed of so few elements that "every lick had to count and contribute to whatever interior environment and exterior composition was to be gained." Seldom does such a completely happy synthesis occur. When it does, it spells Architecture with a capital "A."



On the east end, away from the view, is a comfortable, sheltered porch, paved with redwood blocks. From here the owner can enjoy the adjacent garden and the friendly protection of a fine redwood grove. The small picture below, at the left, is of the west end of the house.

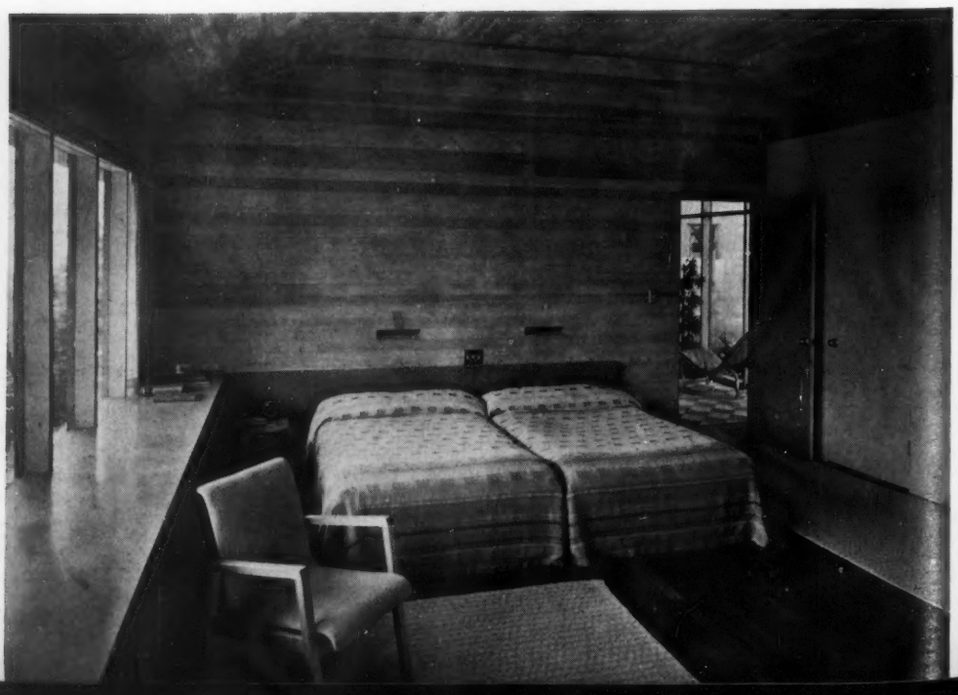
The colorful living room merges with a generous dining space from which the view toward a distant ocean bay is emphasized by the surrounding glass. The deep, rich color scheme is keyed to the large redwood wall and dark floor surfaces.

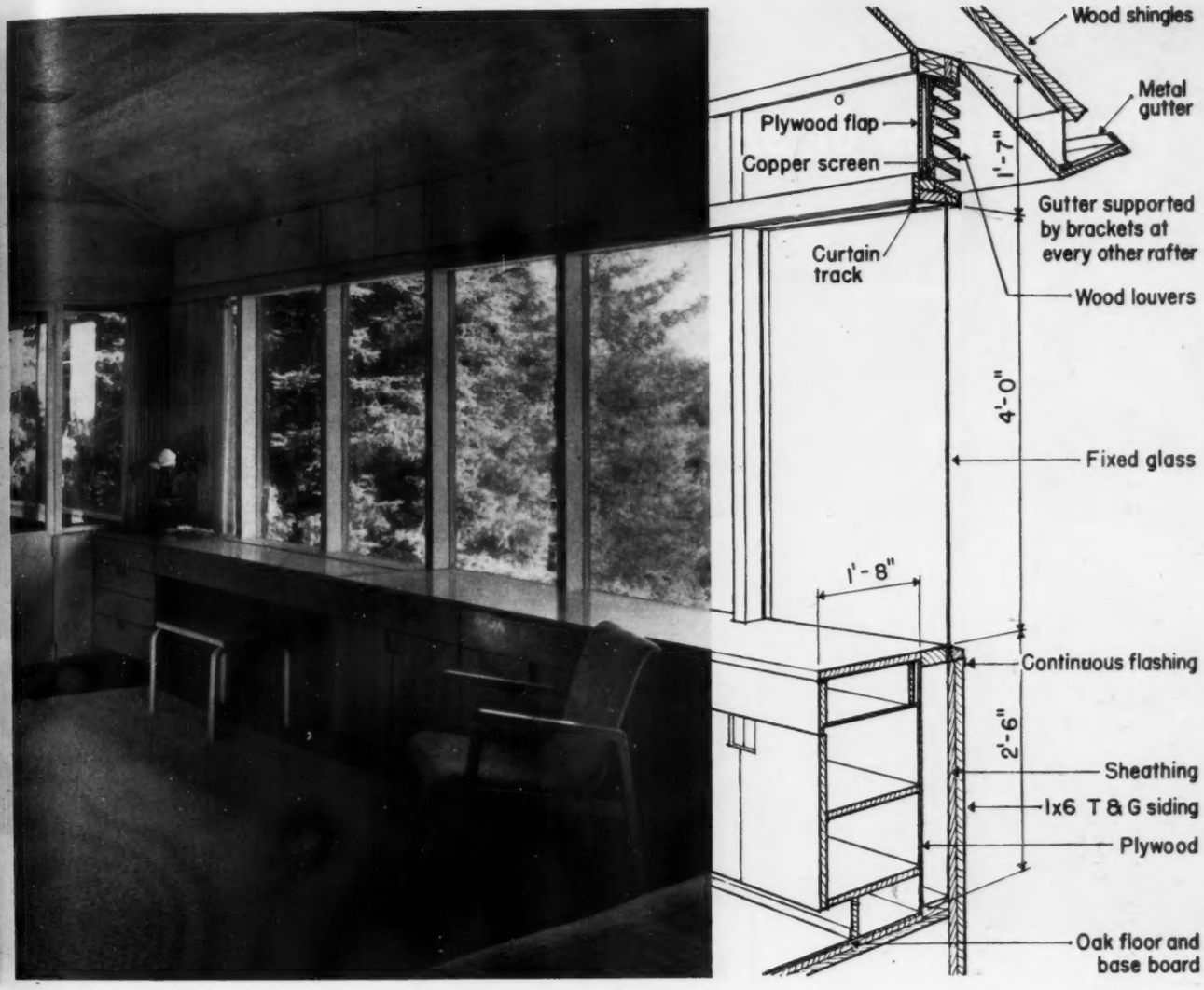
The other end of the main living room leads, via a short flight of steps, to the gallery and more private parts of the house. Outside, a wide sun-terrace, which extends around the living area, invites enjoyment of the outdoor view.



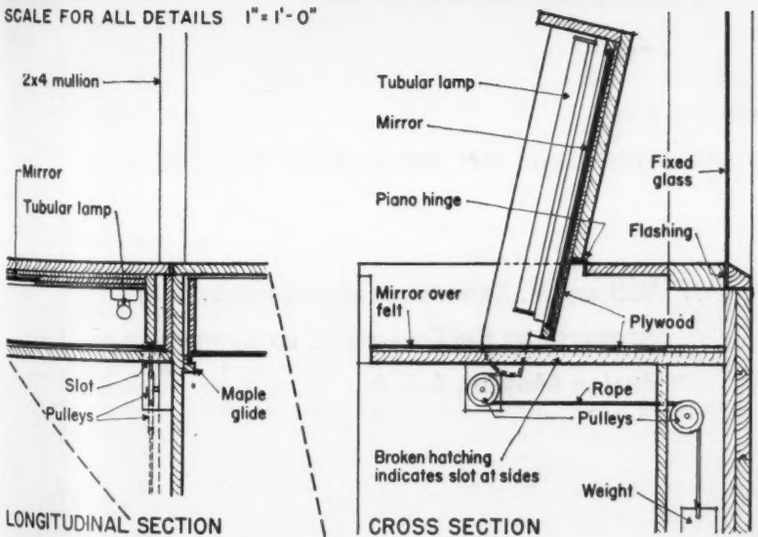
Two views of the library which serves as a quiet place for withdrawal without becoming cut off from the general free-flowing space of the house. At the left, the photograph taken from the gallery looking down through the main living space gives a sense of the continuity and interpenetration of the whole design.

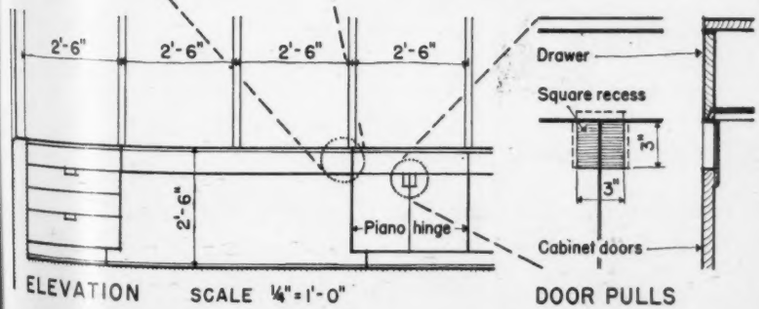
Luxurious, uncluttered restfulness is fittingly achieved in this master bedroom. Clear pine walls and ceiling, with soft reds and yellows on the fitted cabinets and furnishings, make a pleasant and undisturbing color foil for the magnificent view outside. The fixed glazing in conjunction with louvers, a device the designer has used for some years, has many advantages and has proven wholly satisfactory in this house.

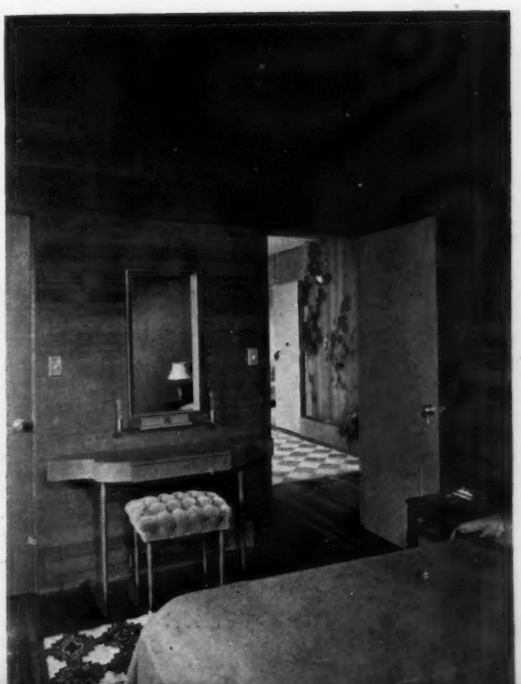


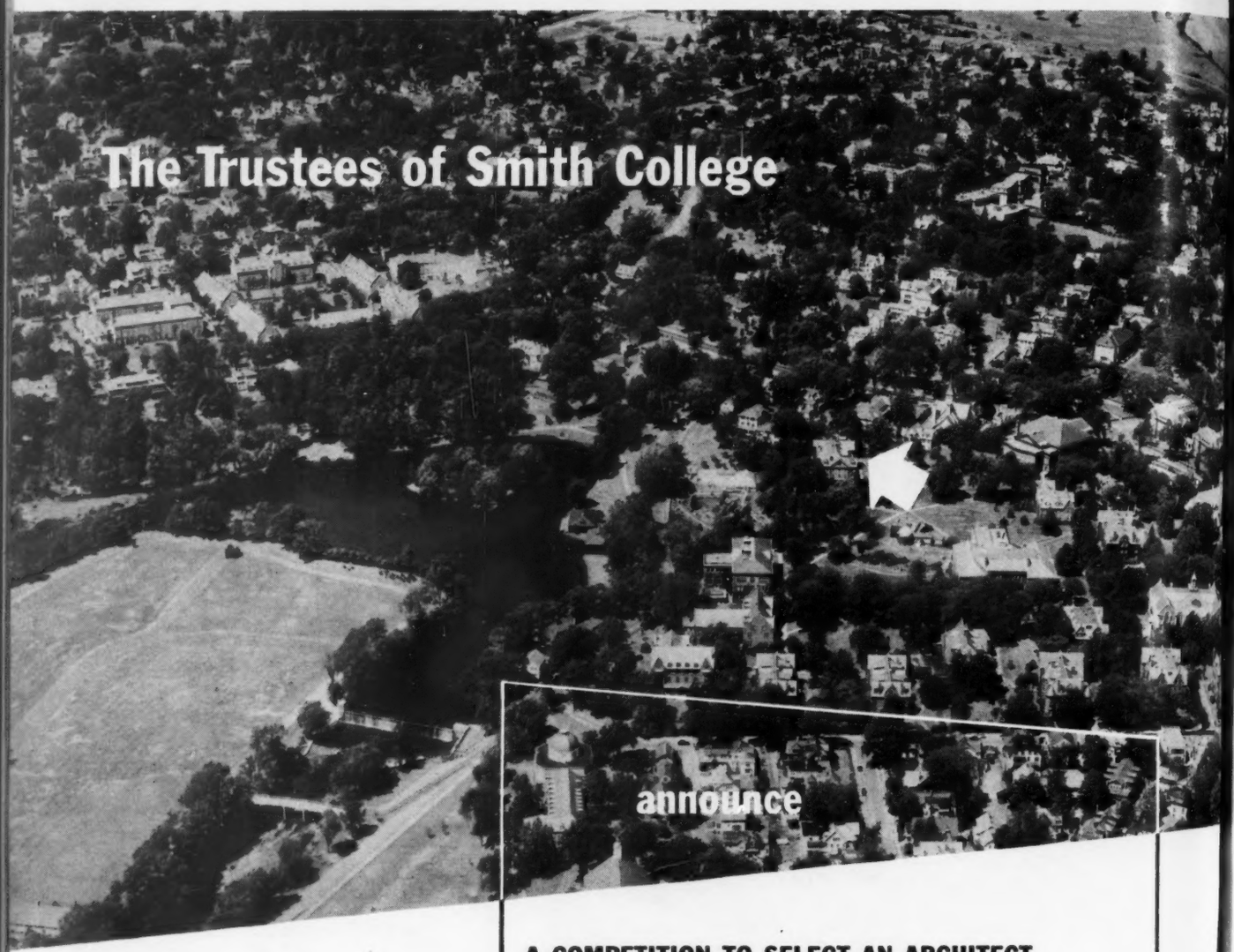


SCALE FOR ALL DETAILS 1" = 1'-0"









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THE ACOUSTICS OF MUSIC SHELLS

BY HENRY L. KAMPHOEFNER, A.I.A.,
PROFESSOR OF ARCHITECTURE,
UNIVERSITY OF OKLAHOMA

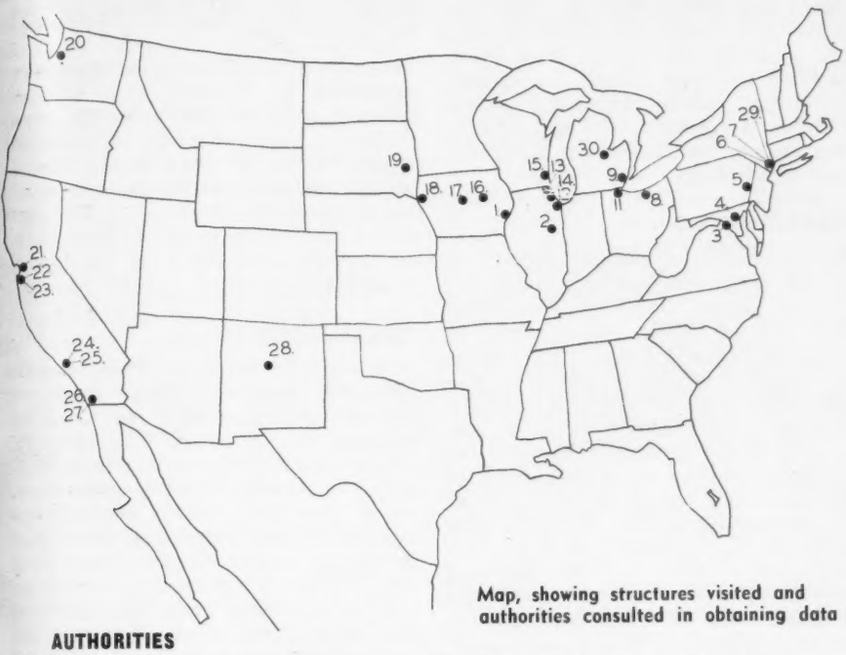
This is Part I of a two-part article which is the result of an Edward Langley Scholarship of the A.I.A. In it, examples of outdoor sound-reflecting buildings are studied and theories of eminent designers and physicists are explored. The work entailed considerable travel, correspondence, study, and comparison of known data. The author acknowledges assistance of the Research Committee of the University of Oklahoma.

Since the beginning of the century most cities and many of the smaller towns of the country have built music shells. The quality of music has developed as popular appreciation has increased. It is questionable whether the architecture of the buildings has kept pace with the music.

Most of the architects of the country have been in a state of confusion when designing music shells. Although several articles have been written describing the proper acoustical form for the reflective surfaces, no careful research or full analysis of the problem has been carried out.

EARLY EXAMPLES

Many of the early sound shells were designed without even an elementary consideration for the simplest fundamentals of sound reflection. The ellipsoid shape was often used. That form reflected all sound from the stage to certain focal points in the audience area, where a bedlam of raucous noise was heard. At certain other points the



Map, showing structures visited and authorities consulted in obtaining data

AUTHORITIES

2. Prof. F. R. Watson—Physicist—Urbana, Ill.
6. C. C. Potwin—Engineer—New York City
9. Eliel & Eero Saarinen—Architects—Detroit
13. Wm. A. Ganster—Architect—Waukegan, Ill.
25. Vern O. Knudsen—Physicist—Los Angeles
30. Alden B. Dow—Architect—Midland, Mich.

BUILDINGS

1. Davenport, Iowa—Kruse & Parish, Architects
3. Watergate—Washington, D. C.—W.P.A.
4. Clifton Park—Baltimore—Wyatt & Nolting, Architects
5. Broad Street Park—Philadelphia
7. Sears-Roebuck Shell—New York—Scott Irvin, Architect
8. Edgewater Parkway—Cleveland
11. Walbridge Park—Toledo—Michael O'Shea, Architect
12. Grant Park Music Shell—Chicago—South Park Board
13. Waukegan, Illinois—Wm. A. Ganster, Architect
14. Ravinia Park Opera Shell—Ravinia, Ill.
15. Blatz Music Shell—Milwaukee, Wis.—Fitzhugh Scott, Architect
16. Bandshell—Ackley, Ia.
17. Fort Dodge Music Pavilion—Designed by Author
18. Grandview Music Pavilion—Sioux City, Ia.—Designed by Author
19. Bandshell—Brookings, S. D.
20. Music Shell, Volunteer Park—Seattle—John G. Howard, Archt.
21. Greek Theater—Berkeley, Cal.—John Galen Howard, Architect
22. Open Air Theater—Golden Gate Int. Exposition, San Francisco
23. Spreckels Music Pavilion—San Francisco
24. Greek Theater—Griffith Park—Los Angeles
25. Hollywood Bowl—Hollywood, Cal.—Vern O. Knudsen, Consultant on Acoustics—Frank Lloyd Wright, Architect
26. Organ Shell, Balboa Park—San Diego
27. Ford Music Shell—San Diego Exposition—Richard Requa, Archt.
28. Highland Park Bandshell—Albuquerque, N. M.
29. Lewisohn Stadium — New York
30. Midland, Mich., Music Shell—Alden B. Dow, Architect

Fig. 1—Shell, Ackley, Ia.

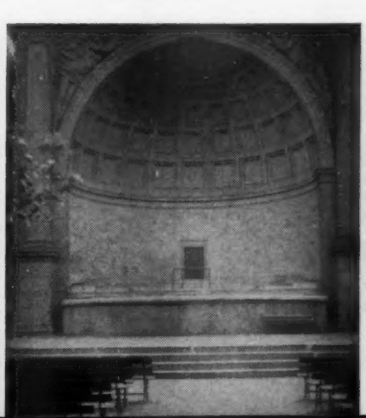


Fig. 2—Spreckels Music Pavilion, San Francisco, Calif.

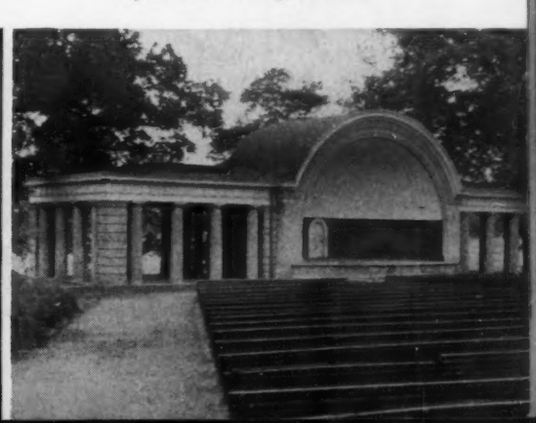


Fig. 3—Clifton Park, Pavilion, Baltimore, Md.; Wyatt and Nolting, Archts.

drum might be emphasized, and at others, diminished. At other points the violin might not be heard at all. That type of shell has been used in a large Canadian city at a cost of $150,000. The final solution for the city was a public address system, for there was no way of correcting the fundamental error in the shape of the shell short of completely rebuilding it.

The small shell at Ackley, Iowa (Fig. 1), is ellipsoid in form. It tends to focus sound at certain definite points in the audience area. However, the space for spectators is so small and the din of traffic around the square so great that this defect probably passes unnoticed. This music shell illustrates the typical ostentation of the small town in placing the shell where it can be seen by every tourist and traveling salesman who passes through the village. Instead of being on the public square at the rear of a downtown building, it should have been in a quiet portion of an isolated public park, away from the noise and confusion of the town, where the music could be heard unaccompanied by the screech of automobile brakes and the blast of auto horns. At such a site the audience could be more easily screened by tree masses and heavy planting. The site should be a "deaf" one where the volume of music can range from great power to the most delicate pianissimo. The site at Ackley causes a bouncing of sound, a constant echo and re-echo from near-by buildings back and forth to other buildings.

SPHERICAL SHELLS

Typical of a period some years ago are two pavilions, the Spreckels Music Pavilion at Golden Gate Park, San Francisco, and the Clifton Park Pavilion in Baltimore (Figs. 2 and 3). Both shells are spherical, which is somewhat less undesirable than the ellipsoid form but still not a satisfactory reflector. Especially in the Spreckels Pavilion the architects appear more interested in architectural pretense than in study of the acoustical problem. The same form is used in the Edgewater Park Pavilion in Cleveland, Ohio, and the Highland Park Shell in Albuquerque, New Mexico (Figs. 4 and 5). These buildings are designed somewhat less pretentiously, but with the same unfortunate, unsatisfactory acoustical form. The spherical shell is costly to build, complicated, and has much less value as a reflector than a simple, vertical rear wall behind the orchestra. Under no conditions can ellipsoid or spherical forms be justified for a music shell.

The popularity of the outdoor summer symphony led a number of Eastern cities to construct shells for the large audiences that began to be attracted in the 1920's. By that time the defects of ellipsoid and spherical forms seemed to be generally known, but the new forms created in place of them show no further applications of the fundamental principles of physics involved.

PARABOLIC SECTION

The shell in Volunteer Park, Seattle (Fig. 6), appears to be an archetype of the symphony shell at Lewisohn Stadium in New York City (Fig. 7), which is used by the Philharmonic Symphony of New York for its summer concerts. This kind of shell contains two serious defects. The section shows that it focuses sound to the front rows where there is no need for reflection. The design would have been improved had sound been directed toward the rear of the audience space, as in the Hollywood Bowl, which is described later.

The plan of the stage at Lewisohn (Fig. 7a) shows the other mistake in planning the structure. The parallel

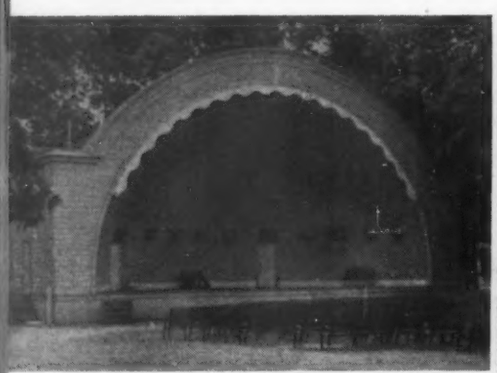


Fig. 4—Edgewater Park Pavilion, Cleveland, Ohio

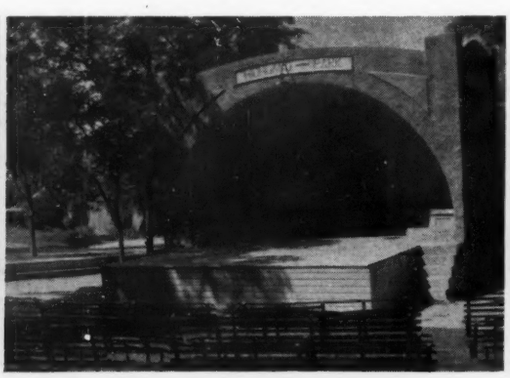


Fig. 5—Highland Park Bandshell, Albuquerque, N. Mex.

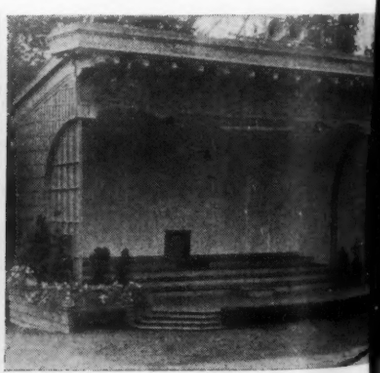


Fig. 6—(Above and right) Shell, Volunteer Park, Seattle, Wash.; John Galen Howard, Archt.

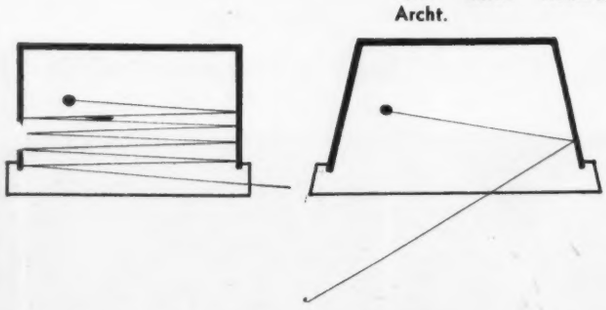


Fig. 7—(left) Lewisohn Stadium Shell, New York, N. Y. **Fig. 7A** (center, above)—plan of Lewisohn Stadium Shell as built. **Fig. 7B** (right, above)—plan as it might be improved; see text.

sides cause a slapping back and forth of sound within the shell. Since sound is not reflected directly out to the audience, the result is a *brrrrrrrr* of noise. If the sides had been fanned out, as in Fig. 7b, this defect would not have existed. Sound striking the side wall would have been reflected to the amphitheater and would not have bounced back to the opposite wall.

Henry W. Simon, music critic for *PM*, writes: "For outdoor music, the acoustical setup at Lewisohn Stadium is fairly good—much better than it once was, though in certain seats one still gets a marked echo when the brasses are playing, and loud-speakers distort the balance. For instance, it was hard to tell in some bravura passages of the concerto whether Mr. Serkin was playing too softly, the orchestra was playing too loudly, or the microphones were not picking up the middle register instruments. One would guess the last, as during most of the performance the conductor and soloist achieved a fine dynamic balance." Had Mr. Simon guessed that the trouble started on the drafting table of the architect who designed the shell, he might have been right. One other error is evident at Lewisohn Stadium, not in the shell itself, but in the design of the amphitheater. This problem was very ably solved by Architect Richard Requa of San Diego in his design of the Ford Shell at the San Diego Exposition, and will be discussed later.

The Watergate Shell, built on a coal barge and towed to Watergate beside the Memorial Bridge in Washington (Fig. 8), is the site of summer concerts of the National Symphony. This site is unsatisfactory because of automobile background noises over the Memorial Bridge. The shell, furthermore, has the same fundamental error found at Lewisohn Stadium. This time the floor and ceiling are parallel. But since the areas are greater than on the sides at Lewisohn, reverberation of sound is more pronounced and is distinctly audible, even above the loud-speakers. The designer could have avoided this error by inclining the ceiling—and it could still be corrected by breaking up the ceiling into short surfaces each with the proper inclination.

FLAT PLANES

The music shell and speaker's rostrum in Philadelphia in the downtown park on Broad Street (Fig. 9) is located in the midst of the city's din, and has no value as a sound reflector because of the tremendous background noise. Nevertheless it is an interesting departure in design in that it has no concave elements. The ceiling is inclined, and the rear portions of the sides are fanned out to reflect sound into the audience. Two acoustical defects in the structure are that the front portions of the sides are parallel and that the ceiling is broken up only for the sake of decoration and not as indicated by its function, so that it does not operate acoustically as well as the over-all form might at first indicate.

Three sound reflectors which consist of a simple rear wall behind the speaker or orchestra are worthy of discussion. In each case the site has been carefully chosen for seclusion and is well screened by tree masses. The organ shell at Balboa Park in San Diego (Fig. 10) is not particularly effective in its present use with the organ, but it would double the effectiveness of music which might be played before it. This simple rear wall, which can be built more easily than any of the complicated structures already shown, reflects music more evenly. The Greek theater in Griffith Park, Los Angeles (Fig. 11), functions in the same manner except for the addition of the sides which, on

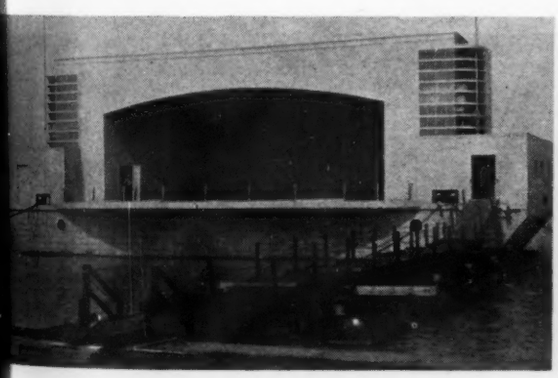


Fig. 8—Watergate Shell, Washington, D. C., designed and built by WPA.

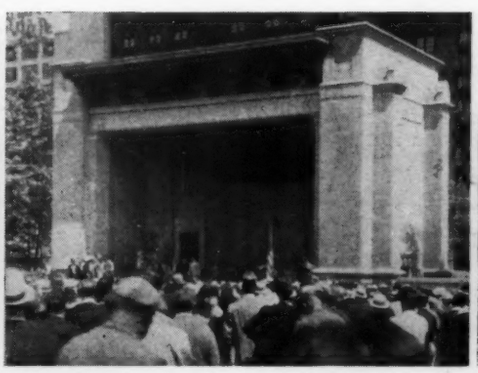
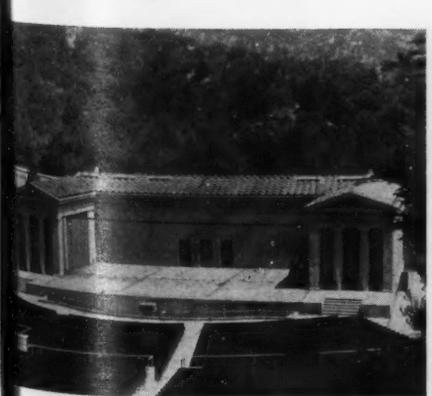


Fig. 9—Speaker's Rostrum, Broad St. Park, Philadelphia, Penna.

Fig. 10—Organ Shell, Balboa Park, San Diego, California.

Fig. 11—Greek Theater, Griffith Park, Los Angeles, Calif.



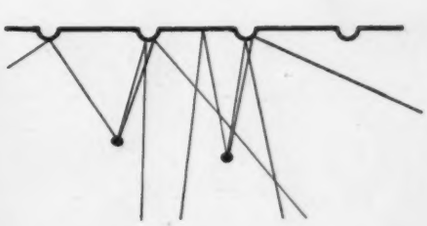


Fig. 12—Greek Theater, Berkeley, Calif.; John Galen Howard, Archt. Above, plan showing sound dispersion.

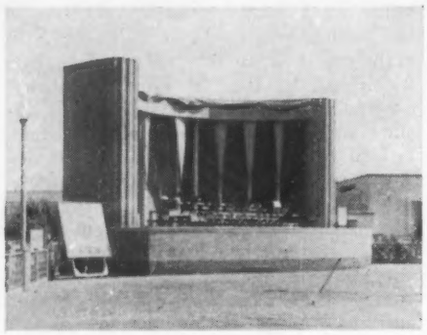


Fig. 13—Open Air Theater, Golden Gate International Exposition, 1939 (San Francisco, Calif.).

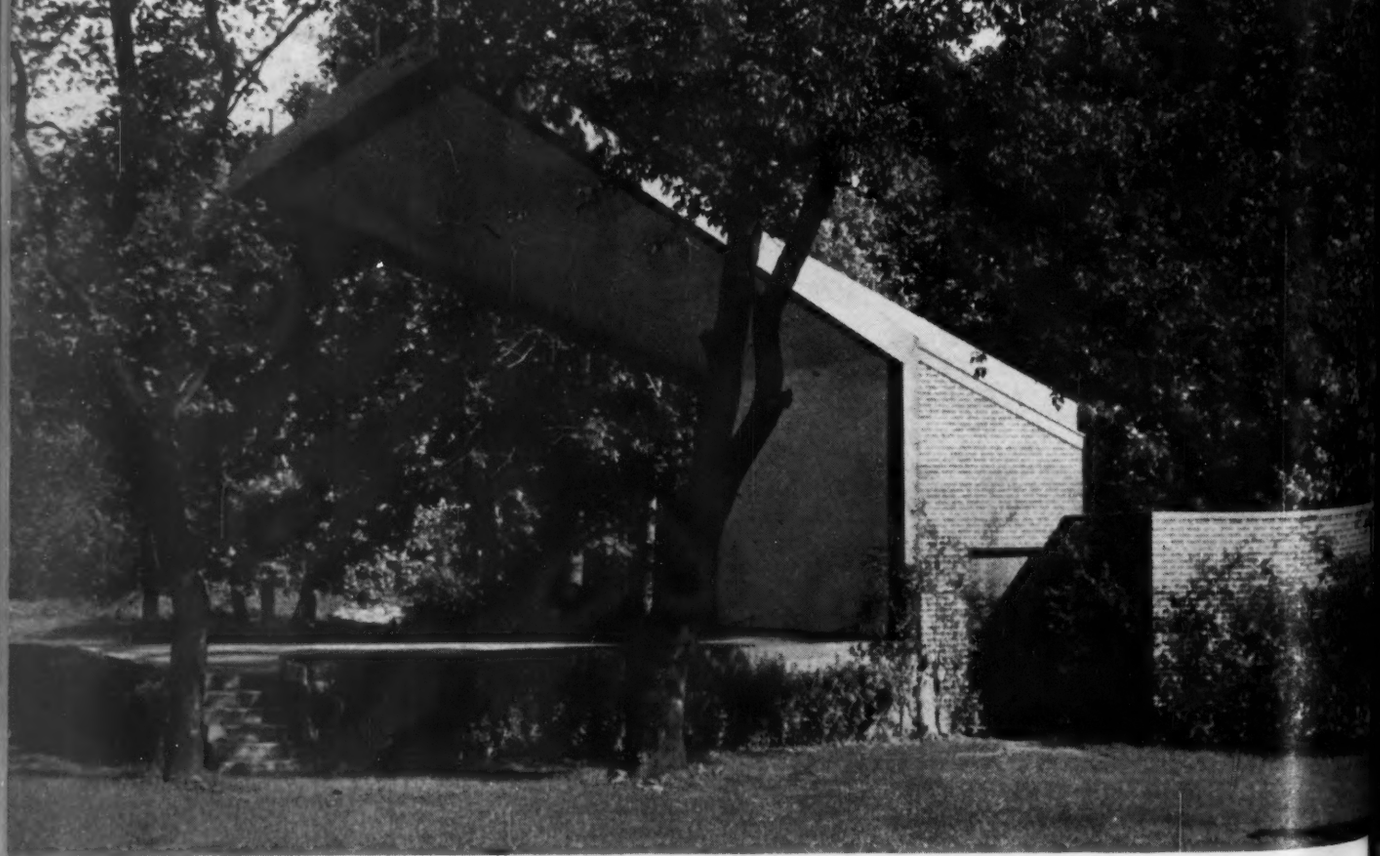
this building, are at such a distance from each other that the reverberation time is increased, and the acoustics are considered good.

The Greek theater at Berkeley, California (**Fig. 12**), is well known for its excellent acoustics. It is adequately screened by trees and heavy planting, and the audience area is not large. In using eclectic forms the architect unconsciously used a series of alternate flat and convex surfaces along the flat wall, with Doric columns that reflect and spread the sound as shown on the adjoining drawing. This combination of forms (which has been used very successfully on the rear wall of a number of modern theaters, to spread the sound) probably accounts for much of the success of the Berkeley theater. For the town with the modest budget, the simple rear wall is the easy solution if the demand for ostentation can be overcome.

A modification of the vertical wall is the reflecting wall of the Open Air Theater built for the Golden Gate Exposition at San Francisco (**Fig. 13**). This reflector does not have the focusing effect of other concave surfaces which have been discussed but as will be shown later the side walls do not have the same efficiency as an inclined roof. This shell could have been even more simplified, and built with an inclined roof, at little additional cost.

It has been shown that the ellipsoidal shape is unsatisfactory because it produces an overemphasis of the tones of those instruments which are located near the focal lines of the concave or parabolic surfaces. The spherical shape as in the Spreckels Pavilion in San Francisco and the parabolic section as in the Lewisohn Stadium shell in New York have also been shown to be unsatisfactory as sound reflectors. Generally speaking, it is true that most curved surfaces should be avoided, although when properly handled the conical section and the convex surface can be used effectively. The use of forms

Fig. 14—Bandshell, Waukegan, Ill.; William A. Ganster, Archt. This is one of the first examples of a music shell with flat rear wall, flat, inclined ceiling, and no side walls.



based on the ellipse or the hollow sphere should be condemned not only for their ineffectiveness, but also for the complications they cause in structural systems and the great expense their use entails.

FLAT REAR WALL PLUS INCLINED CEILING

The small town music committee can now be shown that the music shell of good acoustical qualities can be built of simple design and construction. The vertical rear wall with inclined ceiling is simplest and most economical. Use of a concrete or steel cantilever is particularly effective for such a reflector, but for absolute economy thin columns supporting a non-cantilevered ceiling would be effective without impairing visibility. The complete visibility and openness of such a shell are especially commendable. Architect William A. Ganster of Waukegan, Illinois (**Fig. 14**), was one of the first to discard curved forms and use a vertical rear wall and inclined ceiling. Not a curve can be found on his building. The site has been carefully chosen and could be described as a "deaf" one. It is well isolated by trees and planting so that automobiles cannot create a background noise or disturb its quiet setting. There is no focusing of sound and no two surfaces are parallel to cause a reverberation. This type of shell is effective for audiences up to 2,500 persons. The music shell by Alden B. Dow in Midland, Michigan (**Fig. 15**), is also an excellent expression of this theory of reflection. This shell has a vertical rear wall and an inclined ceiling which is broken up horizontally into bands. The latter device spreads the sound evenly by creating the proper pitch while it also keeps the reflecting surfaces near to the sound source. Only one change can be suggested for either of these very fine shells. With a convex surface for the rear wall in place of the flat wall (**Fig. 16**) the sound would be better reflected to the sides of the amphitheater. Such a form was suggested by C. C. Potwin of New York, who acted as consultant to Eliel Saarinen when he was doing the Kleinhans Music Hall. The convex rear wall on the indoor music shell there reflects as much sound to the sides of the auditorium as to its center.

Since the shell with the vertical rear wall and the inclined ceiling is theoretically effective only for an audience of up to 2,500 people, another form or development of a present form has been considered for larger audiences. It has been shown that when the sides of the shell are parallel reverberation is increased and the shell is made less efficient. Therefore several authorities have suggested that addition of non-parallel side walls to the shell might increase its efficiency.

Part II *of this article will appear next month. In it the author analyzes theories propounded by physicists and explores the problem of designing shells suitable for reflecting music to large audiences.*

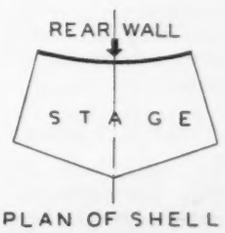


Fig. 16—Improvement on the scheme shown in Fig. 15, suggested by the author, employs a curved rear wall to diffuse sound more effectively over the audience area.

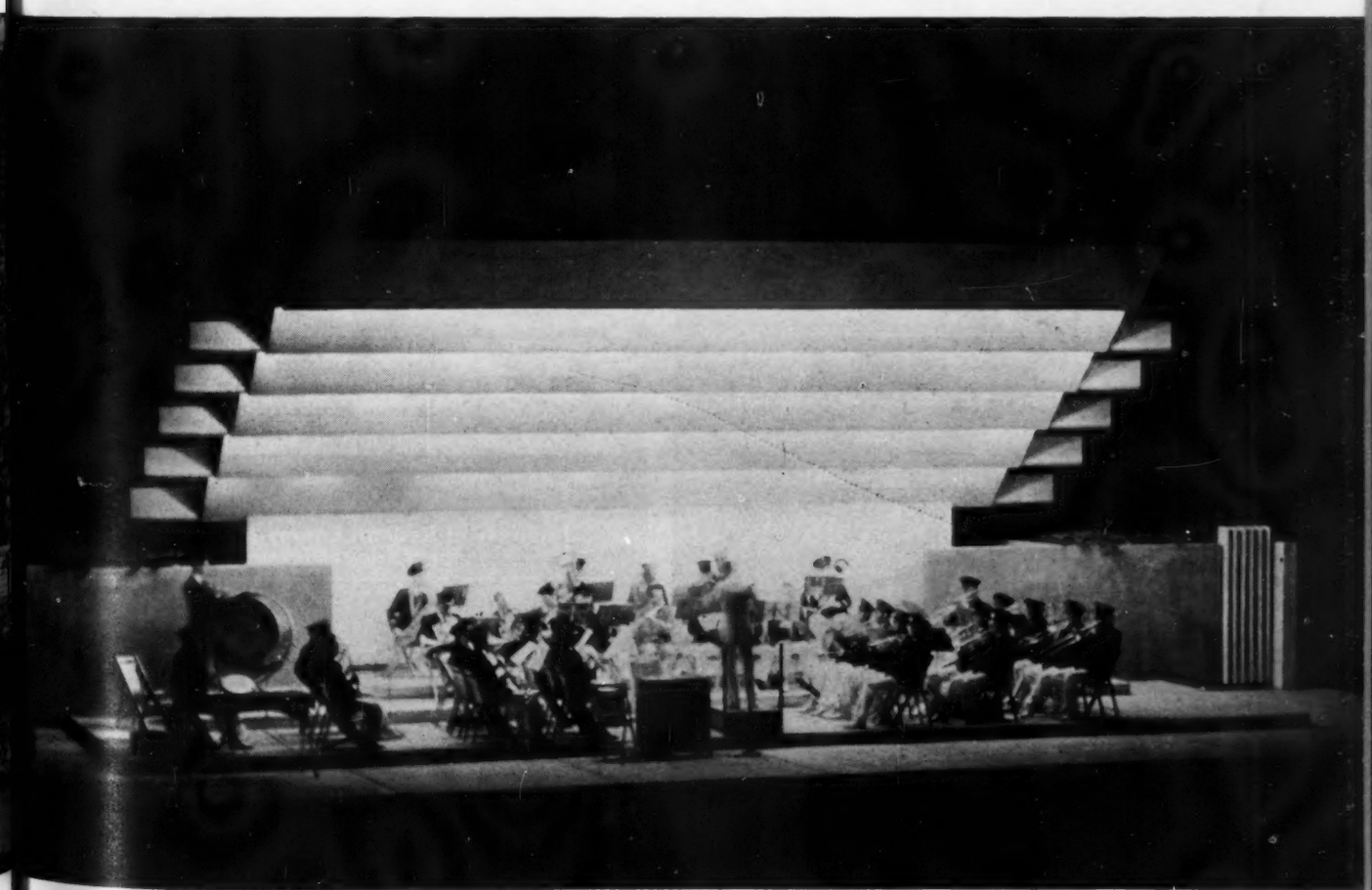


Fig. 15—Music Shell, Midland, Mich.; Alden B. Dow, Archt. This is a further development of the type shown in Fig. 14, in that the flat ceiling is broken up into several reflecting planes in order to avoid too great an extent and expense for ceiling construction without sacrificing acoustical qualities. Note use of spaces between ceiling planes for lighting fixtures.

MATERIALS and METHODS

SCOTCHING THE RUMOR ABOUT FLUORESCENT LIGHT AND EYE TROUBLE

There have always been those who view any advance with suspicion long after its benefits have been proved. The latest activity of this type is a rumor, which has yet reached only mild proportions, to the effect that fluorescent lamps are bad for the eyes. Granted that fluorescent lamps give off more light for less current consumption, the story goes, but did you hear that it hurts your eyes?

To which General Electric's Lighting Research Laboratory says much more than just "Nonsense!" Dr. Matthew Luckiesh and A. H. Taylor, whose professional reputations as lighting scientists are unchallenged, scientifically prove the rumor to be nonsense.

Elaborate tests were undertaken; the results have been published in *Illuminating Engineering* and in the *Magazine of Light*. Effects of three types of energy—those least understood by the general public—were under consideration: ultraviolet, infrared, and visible radiant energy.

ULTRAVIOLET ENERGY

The two ill effects from ultraviolet energy are erythema (inflammation or reddening) of the skin and conjunctivitis (inflammation of the conjunctiva or outer membrane of the eye). To produce effectively either type of inflammation, ultraviolet energy must be of certain short wave lengths. Longer ultraviolet wave lengths can produce it, but tne effects are negligible except in dosages never encountered with fluorescent lamps indoors and seldom outdoors. The least informed person knows that he won't get sunburned if he stays in brilliant sunlight only a few seconds, or in less strong sunlight for a longer period. This means that the erythemal (inflammatory) effects of ultraviolet energy are a matter of *time* times *intensity*. The intensity of erythemally effective ultraviolet energy was measured at midday of a clear midsummer day; so was the ultraviolet output of standard fluorescent lamps.

Results are shown in **Table 1.** Considering that the sun provided 6600 footcandles compared to the fluorescent lamp's 50, direct sunlight contained 0.53 —about half as much—short-wave ultraviolet energy *per foot-candle* as the lamp. (Here the rumor-monger may think he has a foothold! But wait—.)

The same figures, weighted to take into account the capacity of the extremely short-wave ultraviolet energy to produce inflammation (erythematically weighted) indicate that direct sunlight has about 1.63—a little over 1½—times as much capacity per foot-candle as white fluorescent light. In addition, it has been determined that most reflecting surfaces do *not* reflect this type of ultraviolet energy; so, the harmful components of neither direct sunlight nor fluorescent light can be reinforced sufficiently by reflection to cause trouble. One more fact: light from a clear blue sky, without sunlight, can cause more harm of this type than the same intensity of direct sunlight.

INFRARED ENERGY

There is little or no evidence that this type of energy is directly responsible for any biological effect; certainly there is no proof that harmful dosages are obtainable under any type of artificial lighting. Add to that the fact, demonstrated in **Table 2,** that direct midsummer sunlight is accompanied by about the same amount of infrared energy, and the ordinary tungsten filament incandescent lamp from 5 to 7 times as much, as a 40-watt 3500° white fluorescent lamp, and it becomes overwhelmingly obvious that less harm can be expected from fluorescent.

VISIBLE RADIANT ENERGY

In this category, perhaps, there exists a slight basis for discussion. During many years of research with visible and invisible radiant energy, scientists have been led far beyond physics into such realms as physiology, biology, psychology, and ophthalmology. This extended experience leads Dr. Luckiesh to conclude that there is no proof to date that the spectral distribution of any one illuminant is more harmful to the eyes or to the visual sense than that of any other suitable for extensive use. In other words, if fluorescent light itself is bad for your eyes, so are incandescent electric, gas, and candlelight—and even natural sky light.

The only bases for the rumor about fluorescent light thus become loose theorizing, or speculation without foundation in sound theory or measurement. While both theorizing and speculation have their place, we cannot afford to let them become blocks in the way of progress.

TABLE I

Intensity of Ultraviolet Energy Shorter than λ3150 Measured in Microwatts per sq. cm. for Certain Levels of Illumination during the Midday Hours on Clear Days in Summer, Compared with That from White (3500) Fluorescent Lamps.

a. Direct sunlight
b. Skylight, clear blue sky
c. Sunlight plus skylight
d. Direct fluorescent light, 3500 white

	Footcandles	Microwatts per sq. cm.		Microwatts per sq. cm. per footcandle	
		Actual	Relative	Actual	Relative
Intensity of Ultraviolet Energy Shorter than λ3150*					
a.	6600	56	70	0.0085	0.53
b.	1900	117	146	0.0620	3.85
c.	8500	173	216	0.0205	1.28
d.	50	0.8	1	0.0160	1.00
Intensity of Ultraviolet Energy Shorter than λ3150 Erythemally Weighted†					
a.	6600	7.5	214	0.00114	1.63
b.	1900	15.6	450	0.00820	11.7
c.	8500	23.1	660	0.00272	3.88
d.	50	0.035	1	0.0007	1.00

* Most surfaces do not efficiently reflect ultraviolet energy shorter than λ3150. Therefore, the footcandles due to reflected light are generally accompanied by relatively little of this erythemally effective energy.

† A six-year record of erythemally weighted ultraviolet energy in daylight indicates that in midwinter it is about 0.1 that in midsummer at 40° N. latitude.

TABLE II

Intensity of Radiant Energy per Footcandle for Various Illuminants

	Microwatts per sq. cm. per footcandle	
	Actual	Relative
Clear skylight through ⅛" glass	4.9	0.61
Sunlight, midday midsummer	9	1.12
Sunlight through ⅛" glass	7.5	0.94
Fluorescent lamp, 40-watt, 3500	8	1.00
Same through ⅛" clear glass	3.5	0.44
Fluorescent lamp, 40-watt, 6500	10	1.25
Same through ⅛" clear glass	4.5	0.56
Tungsten-filament lamp, 60-watt	55	6.9
Tungsten-filament lamp, 100-watt	45	5.6
Tungsten-filament lamp, 200-watt	40	5.0

FLOORS FOR BASEMENTLESS HOUSES

by Frank G. Lopez, Jr.

*Based on research done by the National Bureau of Standards in Washington. Lyman J. Briggs, Director.**

Most contemporary houses either have no basement or have only a small subgrade space for certain equipment. Despite the success of many such dwellings, there remains some popular objection to basementless houses on the score of "cold" or "damp" floors. Waterproofing the floor is a relatively simple matter; but until the Bureau of Standards undertook study of heat losses through such floors, condensation, and similar questions, there was no authoritative data. In "Measurements of Heat Losses from Slab Floors" * the Bureau reports its findings on eight types of floor construction, four of them concrete slabs laid directly on grade, and one wood and three concrete floors laid over unheated crawl spaces.

ECONOMY and COMFORT

From the point of view of economy, heat loss through floors has to be low; and for comfort, the floor should be warm—or at least not cold—to the touch. The two are related; but in view of the fact that, at the same temperature, a dense material such as concrete "feels" warmer than a porous material such as wood, they can be seen to differ. The more dense material has a higher thermal conductivity and a higher heat capacity per unit of volume. Again, if the crawl space is heated by ducts or pipes, or by a heating unit in a partial basement, it is probable that there will actually be a certain amount of heat gain through the floor, and from either the heating or the comfort point of view the fact that the house is basementless presents no problem.

The temperature of such a floor depends upon several factors. If the exterior walls are poorly insulated, the floor will be cold in their vicinity because cold air drafts will descend along them to cool the adjacent floor. Radiation, convection, and conduction all affect floor temperature. The radiant gain may become important; floors laid over unheated spaces have been found to be several degrees warmer than the surrounding air, above or below, due to warming by radiation from ceilings, walls, and contents of the room.

Actual heat loss through a floor laid either on grade or over a crawl space is likely to be economically unimportant, and small compared to the total heat loss of the house. Comfort considerations, in most cases, are at least as important.

TEST EQUIPMENT and PROCEDURE

Fig. 1 shows floors tested, in a building which contained eight test compartments with a shielding compartment at each end. The building was insulated both on the exterior and between compartments, in order to minimize heat exchanges except through the floors under test. There were no windows; crawl spaces under compartments 5, 6, 7, and 8 were equipped with shuttered ventilation ports with areas of 1 sq. ft. per 15 linear ft. of wall (FHA recommendation). Access from compartment to compartment was through manholes which were kept closed and insulated between inspections. Each compartment accommodated a 6 ft. by 12 ft. floor, with the 6 ft. edges on the exposed sides of the structure, an arrangement which approximates the ratio of exposed edge to floor area existing in a one-story house 25 ft. square.

Testing was started by determing the total heat loss from the structure above the floors. The floors were carefully, almost completely heat-insulated during this part of the procedure, and each compartment was individually heated by an electric-steam radiator, so the energy input could be closely checked. After the loss from the superstructure alone was determined, loss from the entire building, including the floors, was similarly found, compartment by compartment.

Heat loss was measured by means of thermocouples placed on the floors at approximately the locations shown in **Table 3.** Observations were made during periods of several days each from November 1 to May 23.

SLAB FLOORS ON GROUND

When the floor slab and normal grade are at approximately the same elevation, heat loss through a slab laid directly on the ground was found to be more nearly proportional to the length of the exposed edge of the floor than to its area. (By "exposed edge" is meant an edge next to, or embedded in, or outside—as in Floor No. 1—an exposed house wall.) Nor is floor heat loss proportional to the difference between indoor and outdoor temperature; it appears to depend upon the temperature of the earth at some region beneath the surface—and this in turn depends upon prior weather conditions.

In order to arrive at formulas for determining in advance heat losses for these types of construction, **Table 1** shows the average amount of heat lost per linear foot of exposed edge in relation to: 1, degree-days; 2, average difference between indoor and outdoor air temperatures; and 3, temperature difference between indoor air and outdoor ground, one foot below the surface and 35 ft. from the building. These heat loss factors are for use in the following formulas, any one of which may be used:

$$Q = LF_1DD$$
$$Q = LF_2(T_{is}-T_{os})$$
$$Q = LF_3(T_{is}-T_g),$$

in which

- Q = heat loss from floor, Btu per hr;
- L = length of edge of floor adjacent to exposed wall of building, feet;
- DD = number of degree-days occurring in month preceding instant for which estimate is made;
- T_i = temperature maintained within building, degrees Fahrenheit;
- T_{os} = average outside temperature during a week preceding instant for which estimate is made;
- T_g = temperature of ground 1 ft. below surface and 35 ft. from structure, at the instant for which estimate is made.

Of the three factors, F_1, F_2, and F_3, it is believed that F_3 would yield the best estimate of floor heat loss. However, since ground-temperature data for many localities are not available, the use of F_3, may be impracticable.

For general purposes, factor F_2 is probably the most adaptable because of the possibility of estimating with reasonable accuracy the average temperature during the coldest week occurring in a locality. This factor will probably yield more accurate results than F_1 because so many houses are maintained at other temperatures than 65F, on which F_1 is based.

No reason is apparent why the data are not applicable for regions where the average outdoor temperature does not remain continuously below freezing for more than a day or so, except that snow, an insulator, may decrease heat loss.

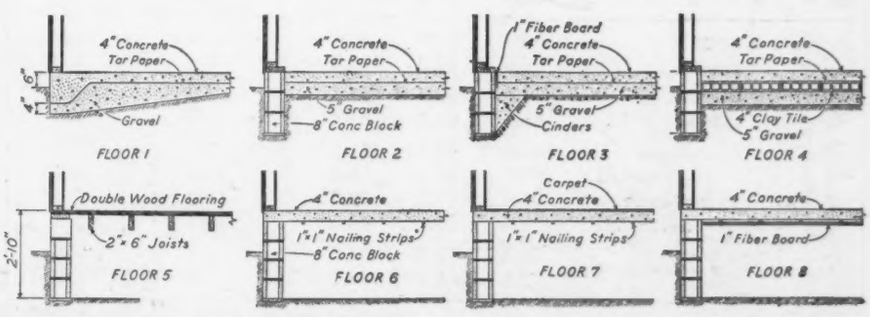


Fig. 1 — Construction of test floors

*National Bureau of Standards Report BMS103, "Measurements of Heat Losses from Slab Floors," March 10, 1945, by R. S. Dill, W. C. Robinson, and H. E. Robinson. Available from Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C., 10 cents.

The data indicate that insulation at the edge of the floor is much more important for floors laid on the ground, so far as warmth in winter is concerned, than insulation under the center of the floor. An arrangement such as that shown for Floor No. 3, or one similar in principle, for insulating slab floors laid on the ground is probably practicable in many cases.

Water may be prevented from entering the floor structure from underneath by using crushed stone, cinders, or gravel, in a depth of a few inches, and a layer of tar paper or other material impervious to water. Such a layer of insulating material between the floor and the mass of earth beneath may also permit the floor temperature to follow the changes in temperature of the air above it more closely. This would lessen the probability of condensation on the floor surface in summer, since, if the floor can be sufficiently warmed by the air at the beginning of a period of warm weather, condensation on the floor will not occur because the temperature will be above the dew point at all times.

TABLE 1 — HEAT LOSS FACTORS * for SLAB FLOORS LAID ON THE GROUND

Floor No.	F_1	F_2	F_3
1	0.035	0.81	1.01
2	.030	.69	0.86
3	.023	.55	.68
4	.032	.75	.92

**Averages from five observation periods*

F_1 = Btu per hr per linear ft of exposed edge per degree-day during preceding month

F_2 = Btu per hr per linear ft of exposed edge per degree F difference in average air temperature between indoors and outdoors

F_3 = Btu per hr per linear ft of exposed edge per degree F difference in temperature between indoor air and ground 1 ft below surface, 35 ft from structure

TABLE 2 — HEAT LOSS FACTORS for FLOORS LAID OVER UNHEATED CRAWL SPACES

Floor No.	Observed [c] Average U	Computed [d] U
5	0.24	0.27
6	.46	.50
7	.42 [a]	—
7	.34 [b]	.38
8	.30	.17

U = Heat loss, Btu per hr per sq ft of floor per degree F difference in air temperatures 30 in. above floor and 15 in. below

a = Bare floor

b = Carpeted floor

c = Test results

d = Based on standard handbook data

FLOORS OVER CRAWL SPACES

Table 2, "Heat Loss Factors for Floors Laid Over Unheated Crawl Spaces," not only indicates the observed conductances of four types of construction, it also offers a comparison with the values computed from data found in the A.S.H.V.E. "Guide." Except for Floor No. 8, the computed and observed values are reasonably in agreement, with slightly greater values for U when computed. Since this would affect heating requirement computations only slightly, and that favorably, the differences for Floors 5, 6, and 7 may be disregarded.

But the discrepancy in these figures for Floor No. 8 is substantial; the observed loss is 43% greater than computations would suggest. Since the floor in question was insulated, the logical deduction is that heat was lost through the floor's exposed edges, and the conclusion would appear to be that it is most desirable to insulate the edges. Installation of an insulating barrier at the edge of a floor laid over crawl space complicates the structural problem, and the expense may make its use inadvisable. A wood floor, however, was found to require no special insulating treatment at the edge. It would seem, then, that if a concrete slab is to be used, it may as well be laid directly on the ground as over a crawl space; and that, if a crawl space is required, a wood floor is advisable.

If the crawl space is ventilated, conductances vary only slightly from those which obtain when there is no ventilation. When the ports are open and there is wind, it is a safe presumption that the air in the crawl space approaches the outdoor air in temperature. For estimating heat losses through floors laid over ventilated crawl spaces, it is therefore recommended that the same temperature be assumed for the crawl space as for the outside.

With no ventilation, the crawl-space temperature will be somewhere between the inside and the outside temperatures and will be lower for an insulated floor and for a greater ratio of exposed foundation wall to floor.

TEMPERATURE DISTRIBUTION

It is desirable for comfort to have a floor whose temperature is nearly uniform at all points. **Table 3** shows the location of thermocouples which recorded data to show temperature distribution, and also shows results of this part of the test procedure. Considered from this point of view, floors laid over crawl spaces showed less variation, and may therefore be considered more desirable, than floors laid on the ground. On the other hand, floors laid directly on the ground showed less difference in temperature between the floor itself and the air above, so that, from this second point of view, the floor on the ground becomes more desirable.

Considering the total variations in temperature, and the conclusions previously noted, it would seem that the floor laid directly on the ground would be most satisfactory; and that, of the examples shown, the type of construction followed in Floor No. 1 is the least desirable because insulation of its exposed edges is not practicable.

CONDENSATION

It is known that condensation on concrete floors or on surfaces adjacent to them can be a source of difficulty, especially in summer. In order to determine to what extent condensation would occur on the concrete floors, the test structure was gently ventilated with outside air under summer conditions. For one part of the test period all floors were left bare; during another part, some were covered with rugs. Although no condensation was visible, the rugs gained in weight. This fact may indicate that slightly worse atmospheric conditions would have resulted in visible condensation.

Sufficient data to generalize are not available, but it may be necessary to remove rugs or other insulating bodies from concrete floors during the summer in climates with a relative humidity similar to that of Washington, D. C.

The amount of condensation will, of course, be increased by cooking or washing operations.

TABLE 3 — *TEMPERATURE DISTRIBUTION, °F

	Floor Number	Distance from wall: 18 in.	36 in.	72 in.	Diff. between air and floor surface	Max. surface diff.
Slabs on Ground	1	60.1	63.1	65.2	4.8	5.1
	2	60.4	63.5	65.7	4.3	5.3
	3	62.0	63.9	65.7	4.3	3.7
	4	60.0	64.0	65.8	4.2	5.8
Floors over Crawl Spaces	5 open	60.9	61.0	62.4	7.6	1.5
	closed	62.6	62.9	64.5	5.5	1.9
	6 open	55.0	56.8	57.4	12.6	2.4
	closed	60.1	61.7	62.4	7.6	2.3
	7 open-bare	59.3	61.0	61.8	8.2	2.5
	-carpeted	52.7	53.2	53.2	16.8	0.5
	closed-bare	59.6	61.3	62.0	8.0	2.4
	-carpeted	58.8	59.6	60.6	9.4	1.8
	8 open	59.7	63.5	64.2	5.8	4.5
	closed	62.1	65.3	66.1	3.9	4.0

**Test Conditions: Air temperature 30 in. above floor, 70F; ground temperature 1 ft below surface, 38.2F*

Products

TOWARD MORE AND COOLER LIGHT

Trends toward large-scale, artificial interior lighting and illumination levels around 50 to 100 foot-candles—requiring higher efficiencies—have focused attention of lighting research laboratories on the old but vital problem of transforming electrical energy directly into visible radiant energy without the intermediate step of heat formation. Scientists are again studying the firefly and luminescent bacteria or bioluminescence in nature, to find a solution.

Nature and Man

90% of radiant emission from a firefly is luminous—nearly 500 lumens per watt—and 10 times the ultimate efficiency expected from a tungsten filament lamp. Emission is confined to a narrow band of wave lengths, concentrated at the central point of the visible spectrum, and very little is lost in emitting red or blue colors.

Whereas nature's illuminants produce light mainly by oxidation (and waste no energy in producing invisible ultraviolet light, and very little in heat radiations), man's latest illuminants generate much of both. Electric lamps emit much light at both the long wave *and* the short wave ends of the visible spectrum, and this radiation is wasted as far as seeing is concerned. But nature's lamps are designed to be seen as signals, markers, or lures, while man's are to reflect light to make surrounding objects visible.

Not the Answers

Since human seeing judgment depends largely upon the color of the object viewed, a monochromatic source of light (such as the sodium vapor lamp which concentrates at a wave length of 5890 angstroms—lemon yellow) results in a distortion of the object's color and thus is not the answer to the problem. In today's version of the fluorescent lamp, much heat production is eliminated and about 18 to 20% of input energy is converted to usable light. This is still not considered sufficient.

An arc discharge through mercury vapor under high pressure (ranging from 1 to perhaps 80 atmospheres) develops luminous radiation at a commercial efficiency of about 65 lumens per watt—which is better, of course. Scientists say this efficiency will be proportionately increased as they are able to increase mercury vapor temperature and pressure.

The Problem

But before temperature and pressure can be increased, a stronger, more heat-resistant container must be evolved. So the real problem is the refractory characteristic of the lamp container. To summarize, the most hopeful candidate for a more efficient light source is the high pressure, metallic, vapor discharge lamp, producing 55-70 lumens per watt, which is theoretically capable of going much higher if a refractory container could be found which would permit temperature increases due to pressures beyond, roughly, 5 atmospheres.

Atomic Fission

Newspaper accounts of the first test of the atomic bomb, appearing in papers August 6 and 7, 1945, reported the generation of intense light, more brilliant than sunlight as it is perceived on earth, accompanying the explosion.

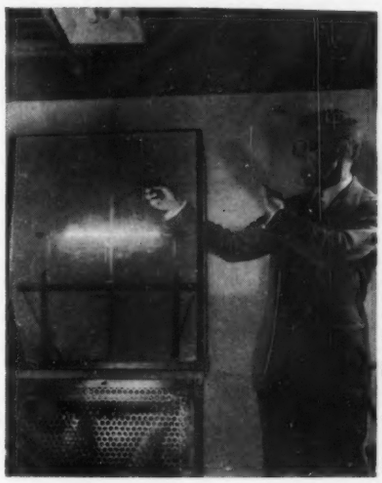


Photo from Westinghouse

This 10,000-watt mercury vapor lamp, so brilliant this picture had to be taken through a special filter screen, radiates enough heat to light a cigarette held near it, although the quartz tube in which the light is generated is cooled by a continuous flow of cold water. This light source has a brilliance one-fifth that on the surface of the sun, and has yielded important data to help find means of color-correcting mercury vapor lamps. Such lamps in smaller sizes —up to 3,000 watts—now are used to light high bays and aisles in war plants.

It is possible that energy derived from this new source, "splitting the atom," may some day be used as a source for both light and power. Considering other statements in the news, to the effect that years of research will be necessary in order to develop and perfect controls for the almost immeasurable energy released, it is unlikely that atomic fission will be a popular, commercially useful energy source for a long, long time.

LIGHTING CENTER

Sylvania Electric Products, Inc., has opened a "lighting center" in New York City, based on research by company engineers, stylists, and architects, in collaboration with Lurelle Guild, design consultant. A series of rooms for the average family—living room, bedroom, study, bath, kitchen—provide a laboratory in which experiments in lighting with both incandescent and fluorescent sources may be carried out.

CURE FOR HUMIDITY

Sylvania's new 40-watt "T-12" fluorescent lamp does not suffer from humidity like the rest of us—a special invisible hydrophobic coating prevents moisture from forming and subsequently slowing the instant-start ballast operation.

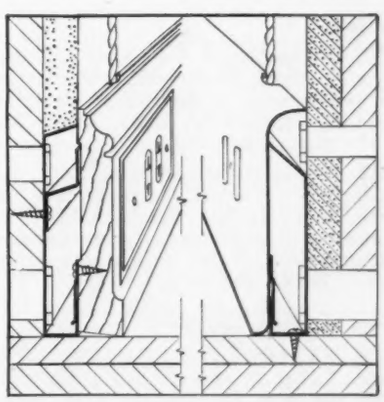
NEW UPHOLSTERY FABRICS

Two upholstery fabrics have been war-developed and are one day to be available to civilians. United States Rubber Co. announces "Naugahyde," a water- and flame-proof fabric unaffected by perspiration, salt water, alcohol, gasoline, oil, grease—and cleanable with soap and water. It is flexible, easy to tailor around corners and edges. We are told it will not harden or crack, will resist edge-wear, abrasion, scuffing, flexing, and wrinkling. In 1943 Naugahyde was made mandatory equipment for all Navy combat ships, and what's good enough for the Navy ought to be good enough for us.

P. C. "Cavalon" is the other fire-resistant upholstery fabric, developed by E. I. du Pont de Nemours and Co. (Inc.). Cavalon is made of a flameproofed cotton cloth base with a flexible, fire-resistant surface coat of synthetic resin. The material will char when it comes into contact with flame, but will not support combustion. It is said to be so pliable that it won't crack in a flexing machine at 30° below zero. After the war it will appear in various colors, grains, and finishes.

FORESIGHT IN ELECTRICAL WIRING

"Erecto-Loxtite-Conduit-Base" is the name of a new conduit with removable baseboard designed for electrical needs of practically any description. The wire-carrying raceway is of 20-gauge steel, 10 ft. long (with duplex knockouts 40" O.C.), fronted by a sliding baseboard which may be of wood, steel, linoleum, or tile—cork, rubber, ceramic, asphalt. The combination of conduit and removable base makes it easy to install or add concealed outlets for light,



power, and telephone service. The conduit's straight metal edge is a help in plastering and tiling; sanding and varnishing are done before baseboard is put on; base is removed for painting. Charles E. Barnes & Son, 4320-22 Osage Ave., Philadelphia, Pa.

MATERIALS and METHODS

Accessories

1-22. *Building Accessories (Cat. 41),* 32-p. illus. catalog on metal building products, accessories for reinforced concrete, nosings, edgings, and thresholds, terrazzo strips and bars. Detail drawings, diagrams, specifications, tables. Ankortite Products, Inc.

Adhesives

1-24. *Technical Data on Pliobond Adhesive,* 5-p. booklet of information on a new synthetic adhesive cement which can be applied almost as easily as household glue, and will bond extremely diverse materials—metals, fabrics, leather, rubber, etc. Strengths, application procedures, properties. Mf'd. by Goodyear Tire & Rubber Co., distributed by United States Plywood Corp.

1-25. *The World of Tomorrow Will Be Welded by a Paint Brush (Bulletin 1800),* 12-p. illus. booklet on the "Reanite" adhesive for bonding metals, natural or synthetic rubber, plastics, wood, leather, glass and ceramic materials. Tension tests. U. S. Stoneware Co.

Air Conditioning

1-26. *Introducing the Air-Vane Line, AIA File 30-E,* 8-p. illus. booklet on air conditioning registers and intakes; frames and installations. Rock Island Register Co.

Communication Systems

3-38. *Bell Sound Systems,* Bell Sound Systems, Inc. Reviewed August.

3-33. *Catalog and Handbook of Electrical Signals, No. 61,* Faraday Electric Corp. Reviewed August.

3-30. *Faraday-Dudley Watch Report System,* Stanley & Patterson Division of Faraday Electric Corp. Reviewed August.

Concrete Block

3-39. *Haydite Building Units, AIA File 10a2,* 32-p. illus. booklet on a lightweight aggregate building unit for masonry construction. Properties; sound and thermal insulation values; construction methods; specification; detail drawings. American Aggregate Co.

Conduit

3-37. *Orangeburg Fibre Conduit,* 8-page booklet (6x9), illustrated. Information on and general properties of electrical conduit, under-floor ducts, drain and sewer pipe. Fibre Conduit Co.

3-40. *Therm-O-Tile (Bulletin 451),* 4-p. folder on a conduit for protecting underground piping. Specifications; installation photos; data on waterproofing "Therm-O-Tile" for submerged conditions. H. W. Porter & Co., Inc.

Doors and Door Equipment

4-28. *Your Own Private Doorman,* 6-p. illus. folder on the "Avco" automatic door operator for opening and closing garage doors from inside the house or while in the car. Operation description, diagram. Horton Mfg. Div., The Aviation Corp.

4-29. *Wartime Catalog No. 22W-2,* 4-p. illus. catalog on door closers—parts, prices, wartime maintenance information. Norton Door Closer Co.

Drafting Room Equipment

4-27. *Specifications and Prices of Engineers Specialties Division Products, for Use on All Optical Comparators, Measuring Projectors, Micro Projectors and Shadowgraphs,* Universal Engraving & Colorplate Co., Inc., Engineers Specialties Div. Reviewed August.

Electrical Wiring and Equipment

5-19. *Condensed Catalog 451,* 84-pp., illus. Safety switches, light and power panelboards, switchboards, bus duct systems, and accessories. Capacity tables, motor circuit switch tables, cabinet sizes, K.O. data, dimensional data. Bull Dog Electric Products Co.

5-18. *National Electric Engineering Data Book,* National Electric Products Corp. Reviewed August.

Elevators

5-16. *Sedgwick Standard Specifications for Elevators and Dumb Waiters (1002),* 24-page booklet, designed to aid in specification writing for electric or hand-power elevators and dumb waiters (freight, hospital, sidewalk, residence). Sedgwick Machine Works.

Fabrics

6-30. *Thortel Fireproof Fabrics,* pamphlet (7x7¾). Data on fabrics made of fireproof inorganic yarns (Fiberglas or asbestos). Thortel Fireproof Fabrics.

Fire Extinguishing Equipment

6-20. *"Automatic" Fire Alarm, Control, and Extinguishing Systems (Catalog 49),* Automatic Sprinkler Corp. of America. Reviewed August.

6-28. *How Cardox Fire Extinguishers Tame Tough Transformer Fires,* Cardox Corp. Reviewed August.

6-29. *Out in 33 Seconds Flat!* Cardox Corp. Reviewed August.

Fireplaces, Garbage Disposal Equipment

6-27. *Donley Devices,* 16-p. illus. booklet on "Heatsaver" fireplace units, fireplace construction and furnishings, incinerators, garbage-, mail-, and package-receivers. Dimensions, size tables. Donley Bros. Co.

Floors—Coverings and Maintenance

Armstrong Cork Co. presents a series of "idea" portfolios on store modernization based upon recommendations of trade associations, giving advice on planning, equipment, surface finishes, as follows:

6-33. *Ideas for Those Who Sell Food.*

6-34. *Ideas for Those Whose Business Is Beauty.*

6-35. *Ideas for the Druggist Who Wants A Model Store.*

6-36. *Ideas to Help You Plan A Model Restaurant.*

6-37. *Ideas to Help You Make Your Shop A Show Place.*

6-38. *Ideas for the Shoe Merchant Who Wants A Model Store.*

6-39. *Ideas for the Men's Apparel Merchant Who Wants A Better Store.*

6-40. *Ideas to Help You Plan the Model Market You Want to Have.*

6-31. *Goodyear Static-Conductive and Spark-Resistant Rubber Flooring for Munitions Plants,* 9 pp. Information on sheet rubber for floors, tables, and benches for munitions plants. Specifications on materials, sub-floors; method of grounding, testing installed floors; installation; maintenance; recommended minimum gauges used under varying traffic conditions. Goodyear Tire & Rubber Co., Inc., Chemical Products Div., Builders Supply & Flooring Dept.

6-25. *Sloane-Blabon Floor Coverings,* Sloane-Blabon Corp. Reviewed August.

Glass Block

7-30. *Owens-Illinois Insulux Glass Block, AIA File 10-F (1945),* Owens-Illinois Glass Co. Reviewed August.

7-24. *Beautiful Homes,* Owens-Illinois Glass Co. Reviewed August.

7-27. *Insulux Glass Block "Set in Wood" for Interior Partitions (1B45-4210),* Owens-Illinois Glass Co. Reviewed August.

7-28. *"Daylight with Insulux,"* 16-p. illus. booklet on advantages of glass block panel installations. Short form specifications, technical data, designs, sizes, description, accessories. Owens-Illinois Glass Co.

7-29. *Excellent for Dairies,* 8-p. illus. booklet. Description of and data on use of "Insulux" glass block for new and existing dairy building construction for: sanitation, insulation, low maintenance, light control. Owens-Illinois Glass Co.

Granite

7-31. *Standard Granite Sections, AIA 8-B-3,* 8-p. illus. bulletin, "bringing granite masonry into a plan of dimensional coordination consistent with the plan of (ASA) Project A62." Schedule of sizes; data on saw markings; specifications. H. S. Fletcher Co.

Heating and Heating Equipment

8-53. *B & G Forced Hot Water Heat (SC-44),* Bell & Gossett Co. Reviewed August.

8-43. *Portfolio of Outstanding Engineering in Industrial Heating by Dravo,* Dravo Corp. Reviewed August.

8-44. *Bulletin 634,* C. A. Dunham Co. Reviewed August.

8-52. *Blast Heaters, Booster Units (Cat. 345),* 20-p. illus. catalog. Information on standard surface heating coils for heating, ventilating, drying, and processing systems. Diagrams, physical data tables, temperature rise charts, condensation rates and final temperatures, data on air friction, etc. Modine Mfg. Co.

8-50. *Taco Specialties (Cat. D-99),* Taco Heaters, Inc. Reviewed August.

Insulation

9-35. 4-p. illus. consumer folder on "Alfol" (aluminum foil) blankets for house insulation. Standard specifications; dimensions; application instructions. Alfol Insulation Co., Inc.

Manufacturers' Literature

9-34. *Flintkote Building Insulation Products (SR-3)*, Flintkote Co., Pioneer Division. Reviewed August.

9-32. *Year 'Round Comfort and Protection (No. 80)*, Minnesota & Ontario Paper Co., Insulite Div. Reviewed August.

9-33. *Here's How (No. 71)*, Minnesota & Ontario Paper Co., Insulite Div. Reviewed August.

9-31. *PC Foamglas Insulation for Floors*, Pittsburgh Corning Corp. Reviewed August.

9-30. *Red Top Insulating Wool ("Fiberglas")*, United States Gypsum Co. Reviewed August.

Lighting and Lighting Equipment

12-30. *Ballasts for Mazda F Lamps (Fluorescent) (GEA-3293F, File 5205)*, Gen. Elec. Co., Specialty Transformer Section. Reviewed August.

12-31. *Lighting Planned to Serve (Y-480)*, Gen. Elec. Co., Lamp Dept. Reviewed August.

12-32. *Postwar Lighting for the Medium Home (Y-477)*. 10-p. booklet presenting Helmuth Bartsch's sketches of ideas for lighting a medium-priced postwar home using various types of lamps manufactured by General Electric Co., Lamp Dept.

12-20. *"Mitchelite" All-Steel Industrial Fluorescent Fixtures (Cat. 281)*, Mitchell Mfg. Co. Reviewed August.

Lighting Fixture Glassware

12-29. *Lenslites (Catalog B-56)*, Corning Glass Works, Lighting Division. Reviewed August.

Lighting—Germicidal

12-28. *Germ-Killing Lights (No. 800-45)*, Edwin F. Guth Co. Reviewed August.

Paint

16-51. *A Standard Code for Identification of Piping Systems (B32)*, Arco Co. Reviewed August.

16-53. *Pittsburgh Color Dynamics for Offices, Hotels, and Restaurants*, 24 pp., illus. Discussions on functional use of color; specifications for tints; color chart; data on types of paint for various applications. Pittsburgh Plate Glass Co.

Plumbing and Plumbing Equipment

16-55. *Transitional Data on the Crane Plumbing Line*, 30-p. illus. booklet designed to furnish accurate dimensional data on plumbing equipment for buildings now being planned. Section on residential plumbing, on plumbing for industrial plants, commercial buildings, schools, hotels, apartments, etc. Crane Co.

16-56. *Architects' Views on Flush Valve Applications (Form 477)*, 8-p. illus. booklet summarizing results of a poll among architects on postwar trends in selection of flush valves for hospitals, schools, industrial plants, airports, railway and bus depots. Data on silent-action, foot-operated, top-spud, hand-operated exposed, automatic operation flush valves. Imperial Brass Mfg. Co.

Prison Equipment

16-50. 8-p. illus. booklet on equipment for prisons, jails; Van Dorn Iron Works Co. Reviewed August.

Roofing

18-14. *Long Span Roof Arches*, 4-p. illus. bulletin. Data on steel, wood, and "plastic" arches for permanent, temporary, or portable long-span buildings. Drawings, details. Arch Roof Construction Co., Inc.

18-13. *Asphalt Shingles*, Certain-teed Products Corp. Reviewed August.

18-15. Two 4-p. illus. consumer pamphlets on featherweight concrete precast roof slabs, with essential data on channel, interlock (also with glass inserts), and nailing slabs. Federal Cement Tile Co.

Steel

19-31. *Booklet 127-A (on sheet piling)*, Bethlehem Steel Co. Reviewed August.

19-32. *Bethlehem Steel Sheet Piling (Cat. 151-A)*, Bethlehem Steel Co. Reviewed August.

19-33. *Bethlehem Cold-Formed Shapes (176)*, Bethlehem Steel Co. Reviewed August.

19-36. *Laclede Steel for Construction*, 23 pp., illus. Data on types of construction steel for airports, bridges, buildings, highways, etc. Reinforcing bars; welded unit stirrups for concrete beams, arches, and joists; form and tie wire; joists (dimensions and design properties); chords; pipe; rigid conduit electrical metallic tubing. Data on steel for pavements and highways: wire mesh for concrete; welded dowel spacers; reinforcement for sewer and culvert pipe; interlock forms; etc. Drawings, diagrams, specifications. Laclede Steel Co.

Store Fronts

19-34. *Kawneer "Machines for Selling,"* Kawneer Co. Reviewed August.

Trim

20-17. *Metal Trims*, 4-p. bulletin on colored aluminum used as trim. Illustrations. B & T Metals Co.

20-18. *Marble Trim, AIA File 8-B-1*, 4-p. illus. folder. Photos and description of examples of marble trim on buildings and residences; details. Vermont Marble Co.

Ventilation

22-10. *Computing C.F.M. for Heat Removal (Bulletin D1-45)*, 13 pp., illus. To simplify choice of proper industrial ventilation equipment, this booklet presents the DeBothezat heat exhaust requirement chart, with detailed instructions on its use. American Machine and Metals, Inc., DeBothezat Fans Division.

22-09. *Cooler Fans for Home and Business*, Emerson Electric Mfg. Co. Reviewed August.

Walls and Wall Finishes

23-31. *Sandkote, Cleveland Gypsum Co.* Reviewed August.

23-36. *Masterwalls by Hauserman (Cat. 45)*, 60-p. illus. catalog on prefabricated movable steel interior walls. Mechanical and architectural details of flush, semi-flush, and molded types; wall linings, railings, ceilings, light troffers; specifications; acoustic properties; electrical details; door types. E. F. Hauserman Co.

Water Heaters

23-34. *Smithway Gas Storage Water Heater (Bulletin 559)*, A. O. Smith Corp. Reviewed August.

Windows

23-39. *Collection of Pella Window Ideas for Home Builders (Form 126)*, 23-p. illus. presentation of drawings of various houses incorporating casement windows. Details, diagrams, size tables. Rolscreen Co.

Wood and Wood Preservatives

23-40. *Today's Idea House*, 32-pp., illus. Wood doors, frames, and windows for residences presented in photographs of interiors, with descriptive material and data on each. Detail drawings of door and window frames; information on caring for woodwork. Ponderosa Pine Woodwork.

23-35. *Wood Preservatives*, Wood Treating Chemical Co. Reviewed August.

Pencil Points, 330 West 42nd St., New York 18, N. Y.

I should like a copy of each piece of Manufacturers' Literature listed.

We request students to send their inquiries directly to the manufacturers.

NO.	NO.	NO.	NO.
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NAME POSITION

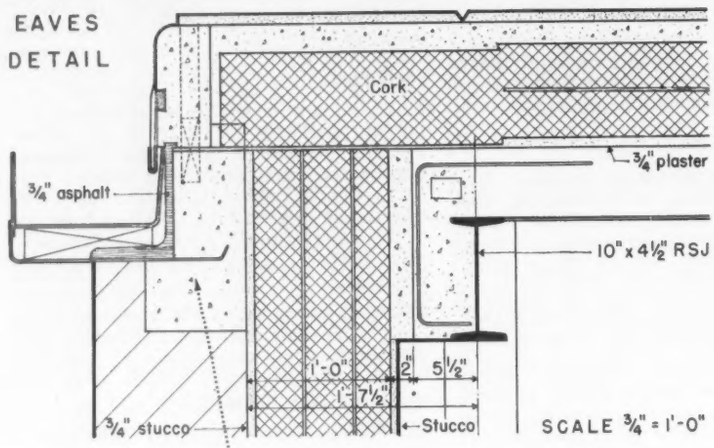
FIRM

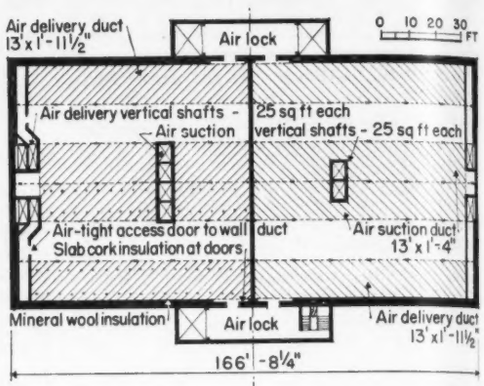
MAILING ADDRESS ☐ HOME ☐ BUSINESS

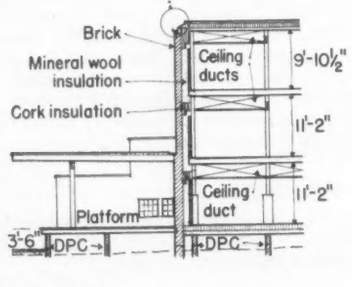
CITY STATE

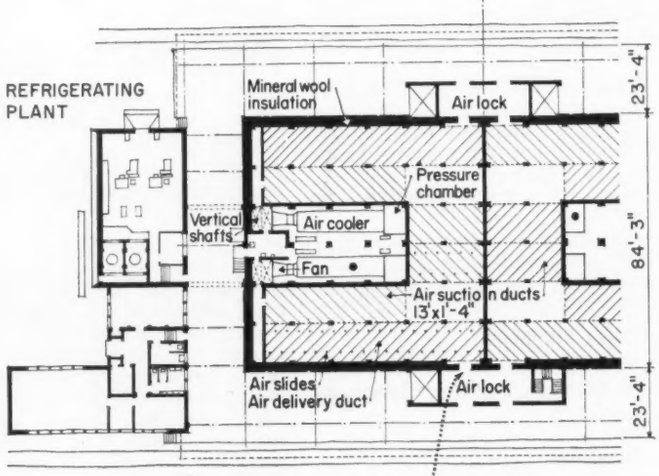
PLEASE PRINT 9/45

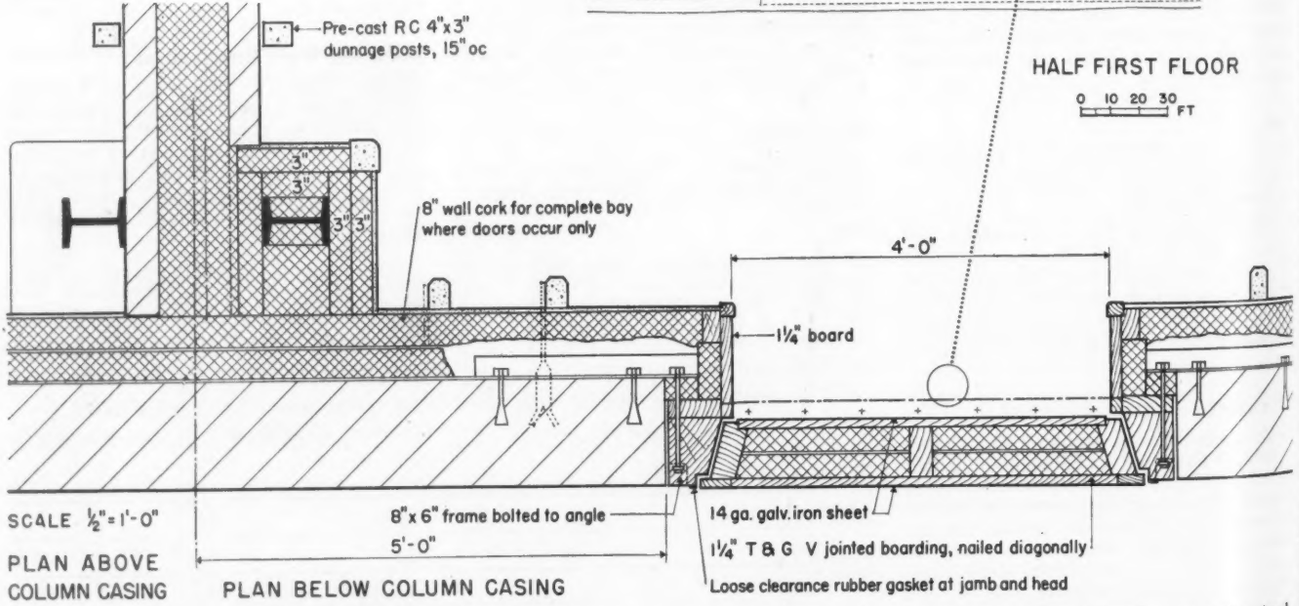
DETAILS—BRITISH GOVERNMENT COLD STORAGE BUILDINGS










Pre-cast RC 4"x3" dunnage posts, 15" oc
3"
3"
3" 3"
8" wall cork for complete bay where doors occur only
4'-0"
1¼" board
SCALE ½" = 1'-0"
PLAN ABOVE COLUMN CASING
8" x 6" frame bolted to angle
5'-0"
PLAN BELOW COLUMN CASING
14 ga. galv. iron sheet
1¼" T & G V jointed boarding, nailed diagonally
Loose clearance rubber gasket at jamb and head

Faced with an unprecedented food storage problem during the war, the British Government designed standardized cold storage buildings of which many were erected. The cold storage capacity of Great Britain was multiplied many times by their construction.

Each building is symmetrical about a center line, with a central storage block flanked on each end by separate structures which house the two refrigerating plants required. Each half of the first floor contains an air cooling space, from which vertical ducts discharge and receive air for the two floors above. Air supplies for each floor are at ceiling level. Access to the various floors is by means of three elevators and one stair, all of which are placed within air locks as shown on the plans.

The buildings have a brick outer shell and steel interior framing. The roof is insulated with 8" of cork slabs, the walls with 8" to 12" of insulation—mineral wool for exterior walls, supported by rigid cork insulation at floor levels. Drawings are adapted from those which appeared in the Architect's Journal.

Insulation Design Data

Building Insulation, *2nd ed. Paul Dunham Close. American Technical Society, Chicago. Cloth bound, 328 pp., illus., tables, diagrams, index.*

A text and reference book teaching fundamental analysis and design of sound and heat insulation, *Building Insulation* presents the design of insulation for many types of construction, although most attention is paid residential buildings. A clear analysis of theories and formulas of heat transfer is adapted by comprehensive tables of coefficients to the practical computation of heat losses from varied types of structures. All types of insulation, for varied construction forms, are represented. Coefficients of commercial examples are listed for each type of insulation. A valuable table listing over 200 commercial insulating materials, with a brief description of each, when used in conjunction with the coefficient tables, enables the reader to approximate the values of most of the materials. Formulas and tables for calculating reduction of heating equipment capacity and fuel losses due to insulation lead to the computation of optimum insulation thicknesses. The design of insulation to control condensation is thoroughly presented. Other chapters deal with pipe and duct insulation, and insulation to prevent undue expansion and contraction of roof slabs.

The theory of sound control is explained and illustrated in three chapters. Average sound reduction factors of 22 partition construction types are tabulated for two sound frequency ranges. Unfortunately, data was available for only two examples of insulated construction. The selection of resilient mountings to dampen machine vibration is based on a transmissibility formula utilizing natural frequencies of machine and mounting. Although several mountings are recommended for usual cases, the formula is not supported by a table of typical frequencies. The control of the reverberation period is the basis of acoustical insulation design. Formulas for calculating the reverberation period are rendered most useful by tables of the sound absorption coefficients of general building materials and many acoustical materials.

Throughout the book considerable attention is paid to the correct application of insulation. Thermal insulation application is treated in a separate chapter. Applications of both sound and thermal insulations are illustrated by clear sketches.

Better Schools

Standards for Schoolhouse Construction. *West Virginia Council on Schoolhouse Construction, Charleston, West Va. Spiral bound, 84 pp., appendices, index. $1.00*

The West Virginia *Standards* are an innovation in state-sponsored publications. Dissatisfied with the meager guidance available to architects employed in the school building program, the State Superintendent of Free Schools, W. W. Trent, appointed a council, charged them with the preparation of standards, saw that their studies were recognized and approved by the necessary authorities.

The resulting guide emphasizes educational planning correlated in importance with structural planning, presents usable material in non-technical terms, and offers a maximum of guidance and a minimum of control. The planning of a school building program, as outlined by the Council, is based on a long-term analytical survey of building needs, planning, and constructing of the building. Detailed suggestions for the selection and development of sites as well as a minutely documented study of the building itself make this an extremely valuable aid for anyone planning a school building in any state.

Plastics

Plastics in Practice. *John Sasso and Michael A. Brown, Jr. McGraw-Hill Book Co., N. Y. C., 1945. Cloth bound, 185 pp., illus., tables, bibliography, index. $4.00*

Plastics in Practice, primarily a review of commercially successful uses of plastics, also gives the reader a clear analysis of material and processes involved in the manufacture of each type of plastic.

For Better Building Codes

Fire Protection Through Modern Building Codes. *B. L. Wood. American Iron and Steel Institute, 350 5th Ave., N. Y. C., 1945. Cloth bound, 244 pp., tables, index.*

Mr. Wood and the Institute join the ranks of builders and architects who are becoming increasingly incensed by our out-dated building codes. They add a convincing list of arguments for code revision, arguments backed by intensive research and practical tests. Discussions of basic considerations involved in restrictive codes and scholarly presentation of data precede a set of recommended fire protection regulations.

TECHNICAL MANUALS, REPORTS

I-B-R Installation Guide Number 1. *Institute of Boiler and Radiator Manufacturers, 60 E. 40th St., N. Y. C. Paper bound, 20 pp., diagrams, charts, plans. 25 cents*

First of a series of pamphlets issued by the Institute covering steam and hot water heating systems, this guide covers the one-pipe forced circulation type of hot-water system.

Westinghouse Home Wiring Handbook. *Artificial leather, 121 pp., charts, diagrams, index. Westinghouse Electric Corp., 306 4th Ave., Pittsburgh, Pa., $1.00*

This handbook for architects, builders, and contractors has been divided into four groups of gradations in electrification. Revision sheets will be issued as changing electrical codes demand.

FROM OTHER PERIODICALS

Concrete Design

Brazilian Concrete Building Design Compared with U. S. Practice. *Arthur J. Boase, Engineering News Record, June 28, 1945.*

As a sequel to his general comparison of Brazilian and American building codes in the April 19th *Engineering News Record,* Mr. Boase here analyses specific differences and their effect.

For this purpose, Mr. Boase secured the working drawings of an apartment recently designed and built in Rio under the Brazil 1943 code and redesigned the construction using the American Concrete Institute Code of 1941.

The building selected was of a height (16 stories) to compare with similar American jobs, was not subject to wind loads, was designed by one of Brazil's most respected structural engineers, Prof. Antonio Alves de Noronha, and has been erected and is giving satisfactory service.

Visible Differences. The low cost of formwork in Brazil leads to the utilization of more complicated framing. A circular stair designed by the Brazilian architect required intricate forms that would entail prohibitive costs in the U. S. Similarly, the floor framing layout shows numerous beams in odd relation to each other which American engineers would attempt to eliminate.

A slab reinforcement table appears on Brazilian working drawings in which the bars and their weights are tabulated and the total weight of steel is figured —reinforcing steel costs 10 cents per pound! No opportunity to reduce the amount of steel is overlooked. A point to be noted is the absence of negative steel where slabs join the beams and girders around the perimeter of the building. It is possible that the slab bars were lifted into the top of the slab after placing of concrete and were "draped" toward the bottom of the slab in the area of positive moment, as Mr. Boase saw done on other jobs. Spans are generally short and beams are placed directly under every partition. All beams are so narrow that none of them project outside the partition. After plastering there was no evidence of the concrete structure.

Floor System. The Brazilian floor system is a two-way solid concrete slab, 3.15" thick, reinforced with 3/16" plain round bars protected by .39" of concrete. (In contrast, A.C.I. standards require a 4" slab with ⅜" reinforcing bars protected by ¾" of concrete.) All beams

are 3.15″ or 3.93″ wide and 22.8″ deep. Reinforcement for shearing stresses exceeding .04 f'_c is provided by short bent-up bars for diagonal tension, in conjunction with an increased allowable stress of .10 f'_c.

Characteristic Brazilian design uses small bars (16-½″ round bars for 30′ girders where Americans would expect 4-1″ bars). Allowable tensile stress for structural grade steel is 21,300 psi; for intermediate grade steel 25,600 psi. This is 28% more than allowed in the A.C.I. code. Moreover, Brazilians use plain bars—apparently their engineers are not concerned about the supposedly harmful effect of wide tensile cracks.

A take-off of quantities shows that the A.C.I. design required 32% more concrete and 26% more steel for the floor system — differences rendered even greater since the American design used intermediate grade steel while structural grade was actually used.

Columns. The most impressive thing about South American multi-story building is the extreme slenderness of the columns, even on reinforced buildings of 40 and 50 stories. In reality they are built according to somewhat liberalized European codes.

Design charts drawn up for columns built to both American and Brazilian codes emphasize the difference in size. The Brazilian code permits, for axial loads, 85% higher concrete stress and 66% higher steel stress and also allows a maximum steel percentage of 6 as compared with 4 for the A.C.I. code.

When bending moment is incorporated in column design, the Brazilian code is even more liberal, permitting an increase of 20% in fiber stresses for both concrete and steel. In other words, if the quantity of the equivalent axial load of the bending moment does not exceed 20% of the axial load, the bending moment may be ignored.

Low Strength Concrete. However, the Brazilian code does not recognize concrete strengths in excess of 2670 psi for building construction. This is probably a wise provision with the method of design used there. Yet they do permit a minimum ratio of vertical steel as low as .008.

Brazilians are able to save on formwork for column construction in that a multi-storied column with a bottom column load of 400 kips might be 14″ square all the way down. A similar American column would have to step from 14″ square at top stories to 18″ square at the middle and 22″ square at lower stories. This means that column form widths must be altered twice, as must form lengths for inter-column beams.

Relative Costs and Volumes of Columns. The loads on the four corner columns, the largest in the building, were selected for detailed study. The stack of columns, 16 stories high, was first designed six different ways for axial loads only. Intermediate grade steel was used throughout and all story heights were taken as 10′. The six types of design were: 2,500-lb. concrete tied and spiral columns by both Brazilian and A.C.I. codes; 5,000-lb. concrete tied and spiral columns by the A.C.I. code. The same material costs were used in all six designs. The costs were computed in such a way as to obtain the cost per kip of load for columns of any number of stories from 1 to 16. Computations showed that, for different design types and differing numbers of stories, A.C.I. costs ranged from 60% down to 20% more than Brazilian; and volumes ranged from 80% more down to approximately the same as the Brazilian. A comparison of columns designed for axial load plus a reasonable allowance for bending affords results similar to those above. However, because the Brazilian code permits an allowable stress increase of 20% when bending moment is considered, relative costs and volumes are widely separated. The comparison is particularly unfavorable to the 2,500-lb. A.C.I. tied column, whose concrete volume was over twice as great as that of the Brazilian.

The unit costs used in these studies are believed to be representative of this country. In Brazil, form costs are much lower, reinforcement costs much higher, and concrete costs about the same. A study of the actual costs of similar columns here and in Brazil shows that up to six stories there is no appreciable difference. Above six stories Brazilian costs are considerably higher. This contrast shows why Brazilian engineers use as little steel as possible.

Provision for Field Inspection. With respect to bending moments in columns, the Brazilian code has a provision more liberal than others heretofore mentioned. For axial load allowable concrete stress is 850 psi maximum. For combined axial and bending load, extreme fiber stress may be increased to 1070 psi. But, "when the inspector carefully verifies that all the provisions of the code have been adhered to, when the calculations include all forces and effects to which the structure is subject, and when necessary precautions have been taken to guarantee a proper strength of the concrete," then the extreme fiber stress may be increased to 1560 psi—for a concrete strength of 2670! In effect, if the equivalent axial load representing the bending moment does not exceed 46% of the actual axial load, bending moment may be ignored.

Comparable Building in U. S. This discussion presents a challenge to the correctness of American design assumptions. There are buildings constructed in this country before we had building codes that are almost as slender as those being erected in South American countries today. When the codes were written in this country, the writers were conservative and their codes required high factors of safety. When materials, workmanship, and design procedures began to improve, there was no comparable relaxation of the restrictive measures of the codes. American engineers, with our labor and material costs, are not expected to go as far as some of the South American engineers; but it does seem that a restudy of our codes would indicate that a middle course could be followed safely, to the advantage of the consuming public.

British Code Revision

The Work of the Codes of Practice Committees. *C. Roland Woods, M.B.E. A paper read before the Royal Institute of British Architects, April 1945. Architect's Journal, London, May 1945.*

Although Mr. Woods was speaking to and for British architects, the study and conclusions of his Committee on Codes have much interest for architects in this country.

The Codes of Practice Committee, independent of the Ministry of Works, was set up by that bureau in 1942 when the war made clear the impossibility of such work being done by many separate units. The Committee, composed of members of professional institutions, divided the code drafting into two sections; Civil Engineering and Public Works Codes, and Building and Construction Codes.

Linked together in a comprehensive scheme, the code has two major advantages. One, it ensures that the necessary field of work be adequately covered and, two, it conduces better cooperation and coordination within the industry. The proposed code attempts to secure an ordered technique and again breaks construction into two parts. The first —the functional requirements of buildings—covers the standard of performance required of the building as determined by its site and use; the second, the main code system, comprises codes and sub-codes for elements of structure and installation of equipment.

First drafts of each section are submitted to the public for comment before final acceptance by the Committee. Such a method assures the writers that its proposals are generally regarded as scientifically acceptable and reasonable.

Many of the codes call for new or elaborated standards of specifications. Standards for materials, components, and appliances are set up by the British Standards Institute, while the *Codes of Practice* specify methods of use.

The Committee has, in the words of Mr. Woods, drafted its code "with the intention of being nothing more binding than the setting out of a desirable method of carrying out a building operation in which event its force is derived from its adoption by consent between the parties, e.g., the building owner, the architect, and the contractor, as an agreed method of carrying out the building work in contemplation."

FIRE-RETARDANTS for Wood Cont'd.

ance requirements. That is, it was not possible to specify a certain depth of penetration and thereby ensure a certain fire resistivity. Lately, however, the Underwriters' Laboratories, Inc., have recommended a series of classifications for wood treated with chromated zinc chloride, and applicable to Douglas Fir and Southern Yellow Pine. Their recommendations are given in the accompanying table.

Prior to this, and today for other woods and other retardants, it has been common practice to specify a desired performance under test as prescribed by the American Society for Testing Materials, the U. S. Navy Department, Bureau of Ships, or other recognized authority. Most of these require that loss of weight during test be limited to 20 or 25%, and have other requirements as to duration of flame (usually 20 seconds) after test flame is removed, etc. Navy specifications recognize two grades of performance, "High" and "Moderate."

However, the U. S. Navy's experience with the quality of structural timber available during the war has led them to change their specification slightly. Many otherwise satisfactory samples failed to meet tests because pitch pockets continued to burn after the rest of the sample was extinguished. Requirements have been modified to permit slightly longer flaming periods. Some such provision will probably be necessary for as long as there is difficulty in obtaining properly seasoned wood.

ADDITIONAL PROTECTION—In addition to providing fire resistance, the chemicals listed offer protection against insect attack and against decay. Penetration and absorption required for fire protection are greater than for preservation. Fire retardants may also be combined with wood preservatives.

FIRE HAZARD CLASSIFICATION*

Characteristic	Retention of Dry Salts per Cu. Ft. 1 lb.	2 lb.	3 lb.	4 lb.
Flame spread	60	40	35	30
Fuel contributed	50	35	30	25
Smoke developed	Less than with untreated timber			

* for chromated zinc chloride only. This is a comparison rating based upon incombustible material as zero and untreated oak as 100, and applies to Douglas Fir and Southern Yellow Pine. Source: Underwriter's Laboratories, Inc.

REFERENCES—

Publications of the Forest Products Laboratories, Forest Service, Madison, Wisc.

Publications of the Service Bureau, American Wood-Preserver's Association, 111 West Washington St., Chicago, Ill.

"Fire-Resistant Wood for Railway Buildings," excerpts from a report of the Committee on Buildings, American Railway Engineering Association, **Wood Preserving News,** March 1944.

"Fireproofed Wood for Airship Hangars," by Capt. W. H. Smith (CEC) USN, **Wood Preserving News,** May 1944.

Specifications, Tests:

U. S. Navy Dept., Bureau of Yards and Docks, **Specification H8,** Addendum B.

U. S. Navy Dept., Bureau of Ships, **Specification 51C40 (INT)**—Chemicals, Fire Retardant, for Lumber and Timber (Recommended Treating Practice).

Proposed Federal Specification for Pressure Impregnation of Structural Lumber and Timber with Fire-Retardant Chemicals (Recommended Treating Practice.)

ASTMC160-41T, American Society for Testing Materials, (Method of Test for Fire-Retardant Properties of Wood).

Specification 38B, American Wood Preservers Association.

Retardant 2755, Fire Hazard Classification of Douglas Fir and Southern Yellow Pine Impregnated with Chromated Zinc Chloride. Underwriters Laboratories, Inc.

SOURCES OF SUPPLY—This list is as comprehensive as reasonable effort can provide; however, there may be omissions. Particularly in connection with such a subject as pressure treatment of wood, there may exist numerous treatment plants capable of producing satisfactory material. Omission does not imply any lack of merit in either product or producer.

Treatment Plants

Alberta Wood Preserving Co., Ltd.	Calgary, Alberta, Can.
American Creosoting Co., Inc.	Louisville, Ky.
American Lumber & Treating Co.	Chicago, Ill.
Atlantic Creosoting Co., Inc.	New York, N. Y.
Baker Wood Preserving Co.	Marion, Ohio
Baxter, J. H., & Co.	Los Angeles. Cal.
Bond Brothers, Inc.	Louisville, Ky.
Brown Wood Preserving Co.	Louisville, Ky.
Canada Creosoting Co., Ltd.	Montreal, Can.
Celcure Wood Preserving Corp.	Jacksonville, Fla.
Colonial Creosoting Co.	Louisville, Ky.
Commercial Creosoting Co.	Longview, Texas
Crosby Lumber & Mfg. Co.	Crosby, Miss.
Eppinger and Russell Co.	New York, N. Y.
Federal Creosoting Co.	Louisville, Ky.
Florida Wood Preserving Co.	Pensacola, Fla.
Forest Products Treating Co.	Portland, Ore.
Georgia Creosoting Co.	Louisville, Ky.
Gulfport Creosoting Co.	Gulfport, Miss.
Gulf States Creosoting Co.	Hattiesburg, Miss.
Indiana Creosoting Co.	Louisville, Ky.
Indiana Wood Preserving Co.	Terre Haute, Ind.
International Creosoting & Construction Co.	Galveston, Tex.
Iowa Wood Preserving Co.	Chicago, Ill.
Kettle River Co.	Madison, Ill.
Keystone Wood Preserving Co.	Philadelphia, Pa.
Long Bell Lumber Co., The	Kansas City, Mo.
Meredith, Wm. C., Co., Inc.	Atlanta, Ga.
Miller, T. R., Mill Co., Inc.	Brewton, Ala.
Moss, T. J., Tie Co.	St. Louis, Mo.
National Pole & Treating Co.	Minneapolis, Minn.
Northern Wood Preservers, Ltd.	Port Arthur, Can.
Piedmont Co., The	Staunton, Va.
Pope & Talbot, Inc., Lumber Div.	Portland, Ore.
Potosi Tie & Lumber Co.	St. Louis, Mo.
Protexol Corporation	Kenilworth, N. J.
Shreveport Creosoting Co.	Louisville, Ky.
Smith, W. J., Wood Preserving Co.	Denison, Texas
Southern Wood Preserving Co.	Atlanta, Ga.
Southwestern Creosoting Co.	Muskogee, Okla.
Taylor-Colquitt Co.	Spartanburg, S. C.
Texas Creosoting Co.	Orange, Texas
Vancouver Creosoting Co. Ltd.	Vancouver, B. C.
West Coast Wood Preserving Co.	Seattle, Wash.
Wood Preserving Div.—Koppers Co.	Koppers Bldg., Pittsburgh, Pa.
Ayer & Lord Div.	Koppers Bldg., Pittsburgh, Pa.
Century Div.	Koppers Bldg., Pittsburgh, Pa.
National Div.	Koppers Bldg., Pittsburgh, Pa.
Wyoming Tie & Lumber Co.	Chicago, Ill.

Producers and Marketers of Chemical Retardants

Albi Firepel Corp.	New York, N. Y.
American Lumber and Treating Co.	Chicago, Ill.
E. I. du Pont de Nemours & Co., Inc. Grasselli Chemicals Dept.	Wilmington, Del.
Koppers Co., Wood Preserving Div.	Pittsburgh, Pa.
Protexol Corporation	Kenilworth, N. J.

FIRE-RETARDANTS for Wood

BUILDING PRODUCT FACTS
Pencil Points • September 1945 • Serial No. 15

Wood can be rendered fire-resistant to a substantial degree by applying solutions of certain chemicals under pressure. The process is similar to that used for treating wood with certain types of preservatives; in fact, the chemicals used are also preservatives. For fire resistance a higher absorption of the chemical by the wood is required.

DESCRIPTION—The process does not make wood completely incombustible, but it does produce wood which will not support combustion. Considered as a building material, fire hazard resulting from the use of wood depends on **1,** extent to which it contributes fuel to a fire; **2,** rate at which fire spreads over its surface; **3,** amount of objectionable smoke or fumes generated. These three factors are usually proportionate to one another.

Treatment with chemicals applied under pressure reduces these three types of hazard in degree depending upon the amount of chemical retained by the treated wood. The exact degree of fire resistance has not been determined for all chemicals used nor for all types of wood, but a start has been made in reporting such data, as will be indicated later. Determining the value of a fire resistant treatment, unlike that of a preservative treatment, is relatively simple because samples can be tested easily. Fire tests are common; but tests for resistance to decay and to insect attack are not.

SHRINKAGE—Depending upon the use to which the treated lumber is to be put, the question of shrinkage may become extremely important. Most fire retardant treatments tend to increase the moisture content of the wood over that of untreated material. The U. S. Navy Dept., Bureau of Yards and Docks, has found that treated timbers are slightly larger than untreated stock, which is attributed partly to the amount of moisture forced into the wood during treatment, and partly to deliquescent action of the chemicals used. However, the Bureau has found that shrinkage troubles on structures built of fire-retardant timber are, if anything, less than on structures built of untreated wood. Possibly this is due to the smaller variation in moisture content of the treated timber.

STRENGTH—Most manufacturers of the chemicals used agree that no conclusive evidence has been published on the effect, or lack of effect, of fire-retardant treatment on the strength of wood. Until very recently there has been little research on this phase of the subject. Exhaustive tests have been under way, but correlation and publication of the findings have not yet been possible. In general, the tests have been evaluated on the basis of a moisture content "adjusted" to compare with the content of untreated timber, and indicate on this basis that many structural properties appear to be improved by the treatment. But if the treated timber has, continuously, a higher moisture content, such a basis is unsound. Nevertheless, the fact remains that any impairment of strength due to the process is probably insignificant except where extreme fiber stresses must be used. Thus care should be used in specifying high fire retardance (which requires high retentivity of the chemicals used) for timbers which may be severely stressed or whose failure may cause serious damage. In other cases, this caution may be ignored.

MOISTURE CONTENT—Physical tests of treated lumber have shown no indications of surface moisture or of undue moisture absorption. However, a certain amount of the chemical solution used is retained in the wood, and only part of this is chemical salts; also, it has been stated that there is probably no suitable salt which is not in some degree hydroscopic (water-attracting). Meanwhile, most specifications demand that chemicals shall not cause hydroscopicity—an indefinite term which implies unattainable perfection. Further research, in order to arrive at a more realistic basis for specifications, seems indicated.

APPEARANCE, WORKABILITY—Treated lumber may take on a weathered appearance; in some cases there may be very slight warping and some roughening of the surface. Treatment with chromated zinc chloride is stated to increase the hardness of the surface, making treated timber more resistant to abrasion, but not to an extent sufficient to cause dulling of ordinary working tools. When sawed or planed, treated wood looks like untreated, but has a distinctive odor which is not apparent when the wood is in place. Workability is not impaired by the treatment.

PERMANENCE—With most materials used for treatment—certainly with chromated zinc chloride—continued exposure to the weather, particularly in localities subject to heavy or long-continued rains, will cause the fire-retardant chemicals to leach out, so that the wood very gradually regains its combustibility. For this reason, fire-retarded wood should be protected from the weather; also, fire-retarding treatment is not recommended for woodwork which is to be placed in contact with the ground, where soil-moisture would accomplish the same result. If treated wood is to be used for exterior finish, such as clapboards, exterior trim, etc., it may be satisfactorily protected with paint or varnish.

PENETRATION—The treatment does not impregnate the full thickness of heavy pieces of timber. Maximum penetration varies, but in general, the effective depth of penetration to maintain sufficient fire resistance to meet the stipulated requirements is not more than ⅜". For example, assume a piece of wood treated to produce "High" fire retardance (the maximum U. S. Navy requirement). The ⅛" layer of wood nearest the surface might contain 5.3 lb. of fire retardant salts per cu. ft. of wood; while the layer from ¼" to ⅜" from the surface would contain approximately 3 lb. per cu. ft. Also, dense heartwood is usually less easily penetrated than sapwood.

CORROSION—Satisfactory fire-retardant chemicals have been found to have no perceptible corrosive effect on hardware, nails, screws, or other metal in contact with treated wood.

CHEMICALS USED—Combinations of ammonium phosphate, ammonium sulphate, zinc chloride or chromated zinc chloride, boric acid, and borax, have been used in fire-retardant treatments. They are available under their chemical names and under trade names as well. Of these, zinc chloride and chromated zinc chloride are reported to be most effective. They are used in water solution, in a normal concentration of approximately 15%. Concentration may be increased to 20% (saturated) for certain purposes. The materials themselves are not patented, although trade names and certain methods of preparing them are proprietary.

TREATMENT—It is highly desirable that all wood to be treated shall be cut to size, shaped, or worked **before** treatment, so that subsequent working will not remove any of the fire-retarded outer layer of wood. If such a procedure is not practicable, portions cut after treatment may be specified to be brush-coated with a saturated solution of retardant in one or more coats (the U. S. Navy prefers three coats).

In brief, the treatment involves subjecting the prepared wood to the vacuum-and-pressure process, in which the wood is placed in a cylinder and as much air as possible is removed by vacuum. Then the retardant is introduced into the cylinder without admitting air, and pressure is applied up to as much as 200 lb. per sq. in. Other types of treatments do not result in sufficient penetration of the wood by the retardant.

After treatment, the wood should be kiln dried or air dried to a moisture content consistent with the use to which it is to be put.

PERFORMANCE—Until very recently there has been little accurate data on which to base specifications as to perform-

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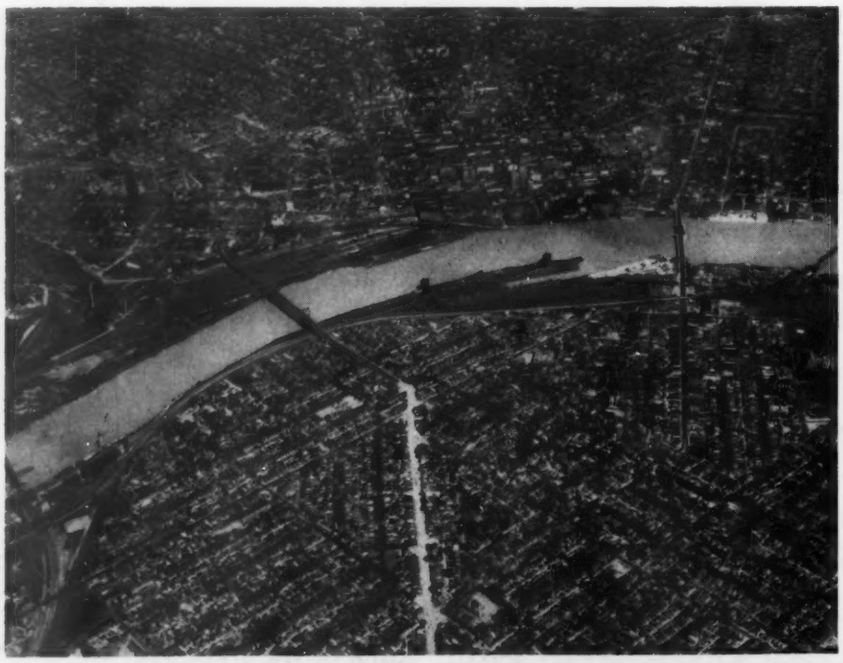
Reviews



MODEL OF TOLEDO PLAN

The aerial views (above) show Toledo, Ohio, and a model for replanning. The present crowded city is contrasted with the "congestion-proof" reconstruction proposed by Geddes. The photograph on the right shows his proposal for a more open downtown area—three-story flat-top office buildings predominating. Most of the taller buildings shown are existing structures.

Toledo Tomorrow, Master Plan for Rebuilding the City of Toledo After the War. *Toledo Tomorrow Committee, Norman Bel Geddes, Designer. Exhibited in Toledo July 4, 1945.*

What About Our Future? *A preview of planning for Toledo and Lucas County adopted by Toledo and Lucas County Plan Commissions, December 8, 1944. Toledo, Ohio, 45 pp., iv index, illus.*

This ALSO is Toledo. *Published by the Toledo Chamber of Commerce, Toledo, Ohio, March 1945, 15 pp., illus., limited circulation.*

OPENS A NEW DIMENSION FOR POSTWAR PROJECTS

Norman Bel Geddes brings city planning to the people of Toledo with a 61-foot model based on the exhaustive studies of the Toledo and Lucas County Planning Commissions. The proposed master plan for the city and his model (*pictured above*) underscore the progressive-mindedness of the lake port.

Usually there is something wistful about a planning commission's report—too often it reads like a youngster's letter to Santa Claus. There's the hope for some parks, the prayer for highways, the plea for slum clearance, and the petition for genuine authority. Without active citizen participation, and lacking real power, planning commissions are prone to tread too easily; generally they eschew the master plan (which might inspire the public) to appease easily aroused special interests.

It is inevitable that any hard-working and sincere commission will evolve what amounts to the basis for a master plan and the 1944 report of the combined planning commissions is a case in point. No master plan is attempted but considerable ground-work has been done. With citizen cooperation Toledo should move forward toward a better city and the challenging Chamber of Commerce publication, together with the ambitious model of Toledo Tomorrow, indicates the necessary public state of mind is on its way.

The Chamber of Commerce's report undoubtedly is unique among publications by similar civic booster organizations. It is a dramatic, unflinching presentation of the Toledo slum picture. Excellent photographs coordinated with strong words describe the miserable conditions scattered throughout the city. The humane understanding of this report is evidenced by its intelligent appreciation for the slum dweller's efforts (albeit unsuccessful) to achieve a measure of decency. While encouragement of private enterprise toward solving this problem is essential, the chamber's characterization of Federal projects as "barracks" in contrast with private developments is misguided (see PENCIL POINTS - PROGRESSIVE ARCHITECTURE, June, 1944).

The awakening of such an organization, coupled with the planning commissions' firm grasp of the community's problems, explains the appearance of the Geddes' model. *What About Our Future?* is a sincere, soberly written restatement of the history of Toledo urbanism, followed by current plans and hopes. The planning commissions of city and county have worked jointly for many years; together they have made numerous valuable studies and every year are advancing the front of planning. But the over-all plan which is missing from the official organizations' report is presented dynamically in Geddes' $250,000 (scale: 1 inch equals 100 feet) model.

Here, are incorporated almost all the schemes modestly proposed by the commissions and other civic organizations —and then some. All blight will be uprooted and replaced by clean structures set amongst greenery. The twelve trunk lines serving Toledo will be coordinated, airport provisions improved, and surface transportation facilitated through ingenious intersections and throughways. Low, widely spaced office structures are proposed; a few skyscrapers and exciting traffic schemes (to tantalize R. Moses himself) will provide drama.

Following previously determined plans, Geddes sods over St. Clair and Huron Streets, creates a riverside park up to Summit Street, and enlarges the civic center northward to site an auditorium. Although most of the city seems likely to be rebuilt before achieving the general form Geddes envisions, his model retains most existing skyscrapers and presents few large scale regroupings.

Probably the most important change, and one which few planning commissions ever have the courage to recommend, will be a completely unified terminal for air, surface, and rail transportation. It is to be presumed that the interurban bus station suggested by the planning commissions for Monroe Street, between St. Clair and Superior Streets, will be combined, instead, with the main facility. This grand scale terminus, located south of the New York Central Railroad tracks and the proposed straightened western approach to the Anthony Wayne Bridge (instead of at one of the commissions' suggested airport sites) will house the many rail passenger stations serving Toledo and provide a Class 4 airport. Here it is virtually in midtown and closely related

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(Continued from page 113)

with the city's office buildings. Air experts claim future flying will not require low structures about airports, but for the moment such a downtown airport would require the razing of any tall structures.

Master planning, as the key to intelligent civic redevelopment, is dramatized by the circuitous connection between the main business section and the Wayne Bridge. Even Geddes cannot achieve a straight connection from Woodvile Road to Monroe Street due to the angle at which the bridge was built, although his plan for an immediate turnoff to Monroe Street probably is the simplest scheme. The limitation of Geddes' dramatic architectural approach toward such problems is indicated by the main western approach to the bridge, which is a grand parkway going nowhere in particular.

It is unfortunate that the present photographs emphasize the more civic aspects of town building; the structure of the home neighborhoods recommended in the commissions' report is not here indicated.

Geddes' enlargements upon the mild suggestions of the planning commissions are many. Apparently intrigued by two or three-storied office buildings, he sites new low structures on generous plots in a manner reminiscent of the temporary structures in Washington, D. C. The result is a welcome and pleasant openness which is a far cry from the mechanistic nightmare of the well publicized Futurama. Horizontal transportation becomes a particular handicap to such a scheme and it will undoubtedly be found that office efficiency will require a fair proportion of many storied buildings.

The *Toledo Tomorrow* edition of the civic center is more gratifying than that of the commissions; it omits two proposed hackneyed buildings and thus permits more greenery and room for expansion. The auditorium also is improved by a clearer architectural expression devoid of monumental herbage.

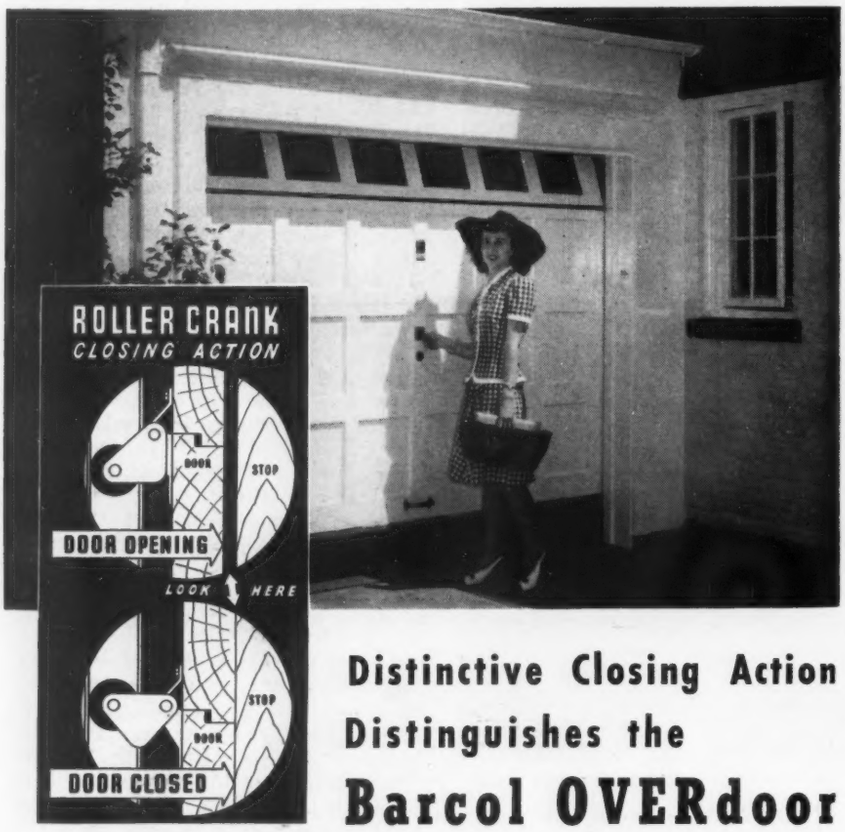
Toledo is to be envied for its realistic Chamber of Commerce, the courage of the *Toledo Blade* in advancing a quarter of a million dollars toward a master plan model, and a planning commission which understands the need for basic studies. It is regrettable that Geddes' brand of planning—so necessary as an adjunct to the reports of sincere but timid commissions—does not include the essential problems of finance and politics. Perhaps the more precise-minded experts of the government group in the lake port will work out a program for achieving the dream community. Certainly, here is an over-all physical plan worth shooting for and working upon; probably it will return its investment many fold.

THE BOSTON CONTEST

Competition—the lifeblood of the market place—is being pumped into planning. Communities compete not only with airports and terminals but with master plans. And, with twofold justification, prizes are being offered in different cities for plans. This scheme is supposed to unearth "unknowns" with grand plans, and also to excite public interest. Whether it does either, frankly, is unanswerable.

The recently judged Boston contest (*The Boston Contest of 1944, Prize Winning Programs*, published by The Boston University Press, 685 Commonwealth Avenue, Boston, 148 p., illus.), and the recently closed Chicago contest (*The Better Chicago Contest*, sponsored by the Chicago Herald-American, 326 West Madison Street, Chicago 6) must be credited with encouraging plan-

(Continued on page 116)



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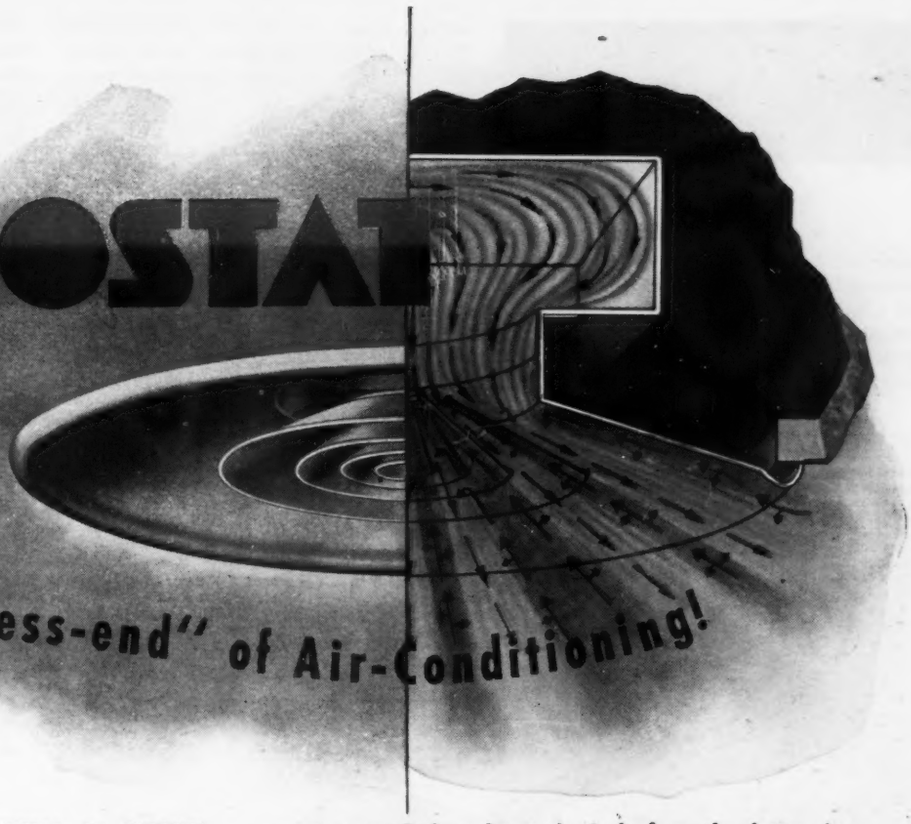
WEATHERTIGHT, yet EASY-WORKING—these outstanding qualities of the Barcol OVERdoor are largely due to a unique closing action, the operation of which is illustrated by the inset drawing above. "Roller Cranks" at each hinge are arranged in such a manner that the door is moved forward as a unit to seat snugly and firmly against the stop strips just as it completely closes. By a reversal of this action, when you go to open the door, it moves cleanly away from the stop strips as it starts upward—and stays clear during its entire travel. In this way the highly desirable advantages of both free motion *and* tight closing are successfully achieved. This not only means that the Barcol OVERdoor opens and closes easily without sticking or binding, but it assures a well-fitted, rattleproof door that will keep out cold and dirt. *Let your Barcol Representative give you a demonstration of the "Roller Crank" Closing Action.*

BARBER-COLMAN COMPANY
100 MILL ST. • ROCKFORD, ILL.

ANEMOSTAT



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When large volumes of conditioned air are forced into a room, drafts occur—unless ANEMOSTATS are used. The patented ANEMOSTAT is an air-diffusing device without moving parts. It is easily installed on any air-conditioning, ventilating, or hot-air heating system. It assures *draftless* distribution of any volume of cooled or heated air at any velocity.

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HERE IS HOW IT WORKS

The ANEMOSTAT diffuser creates a series of air currents flowing away from the device in planes or blankets at scientifically correct angles. In addition, the ANEMOSTAT creates a series of counter-currents of room-air which are siphoned into the diffuser and mixed with the incoming air streams. Thus, 35% of the room air is mixed with the incoming cooled or heated air before the latter is discharged into the room. This action is the only true *"Aspiration"—and it is exclusive with ANEMOSTAT!* No drafts!

This air-mixing action *within* the ANEMOSTAT establishes the required room-temperature at a point well above the breathing level—so no blasts of cold or hot air are encountered by occupants. Higher temperature differentials are thereby possible . . . resulting in smaller volumes of air requiring conditioning.

Higher air-velocities may be employed with ANEMOSTAT because of its draftless diffusion, so smaller ducts and simplification of duct layouts naturally follow. Yes, ANEMOSTAT is the "business-end" of air conditioning!

•

Write today for Bulletin which gives you full details. There's no obligation!

Veteran-ize your personnel!
Many discharged war veterans received valuable technical and specialized training. Always consider veterans when you employ. They did their share —now let's all do ours!

ANEMOSTAT

ANEMOSTAT CORPORATION OF AMERICA
10 East 39th Street, New York 16, N. Y.

Reviews

(Continued from page 114)

ning teamwork of a new type. Political scientists, economists, sociologists, men of affairs, and architects are fused to create a multi-faceted master planner. Both contest programs seemed deliberately worded to attract collective rather than individual contributions. The intelligent emphasis of economic and political problems promoted social science leadership in the various Boston teams. If the sociological problems of our communities also are considered, the pre-eminence of non-architectural questions in true planning becomes incontestable.

But even ample attendance of social scientists did not assure Boston a full treatment of its most serious problem—a fading economic base. Industrial exodus, reduced tax base, increased tax rates, and antiquated public services, spiral further industrial exodus. This will knock out the Hub completely unless the area resorts to drastic over-all action.

Most of the entries seem to emphasize reduction of the tax burden as the key solution. Even if the tax burden is spread to tap the middle-class encampments on the surrounding countryside, Boston and contiguous cities will remain blighted. For the economic decline here is absolute as well as relative; this must either be stopped (and perhaps reversed) or else Bostonians must soberly plan for grass on Washington Street. (Parking lots have already begun to take over choice downtown locations!) A reappraisal of the New England resource structure and encouragement of novel, far-reaching new uses of the more inexhaustible attributes of the area is basic to any planning. A contest should encourage such types of thought rather than grand transportation schemes.

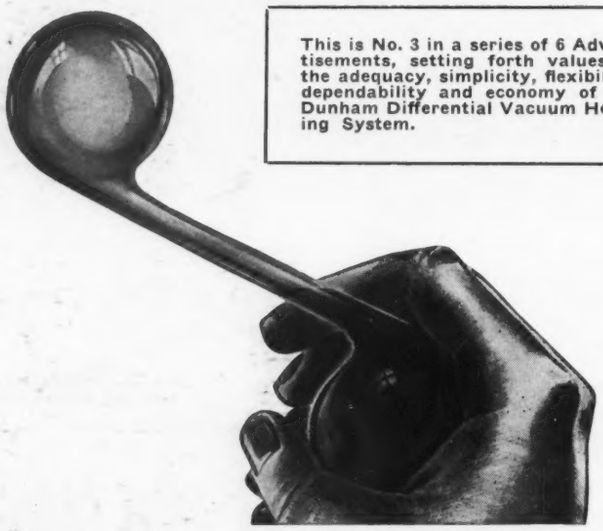
Too much effort is going into easing the commuting for those who have fled the central core. The community and the people would benefit more from development of cheap rapid transit for those families who cannot afford the luxury of eight unused cylinders twenty hours a day. Drawing the fugitive "better class" families back into the city is a solution which should attract those who think of planning in architectural terms; but apparently highways can lure even good men from their true loves.

Boston's most fascinating problem is, of course, political unification of the sixty-odd autonomous communities which combine to create the gray universe about the rotting Hub. The first prize paper (the product of a Harvard Faculty team) establishes a Metropolitan Authority based upon popular election. This is a long first step toward erasing the petty boundaries which have paralyzed past attempts at political efficiency.

We do not claim any special knowledge of what might be done to revive the Hub but we miss the genius touch in the papers published. Boston must be justified to existing industry; and new industries must be created from the region's resources. A short exposition of the production of plastic automobile bodies from natural pine or fish might contain more promise for eastern Massachusetts than a dozen realty tax reductions achieved by sales taxes; indeed it might reassert the greater glory and dignity of the Bay Colony's very own Cod.

It is difficult to assess the value of such contests, especially when nothing may be contracted for directly from the entries. In fortunate communities with master plans and few complications from political disunity or industrial disintegration, the contest money might

(Continued on page 118)



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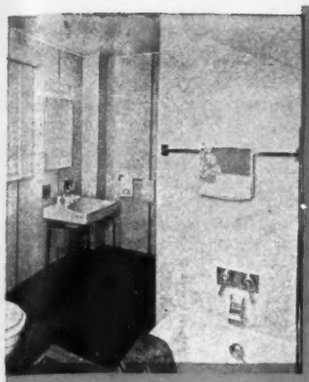
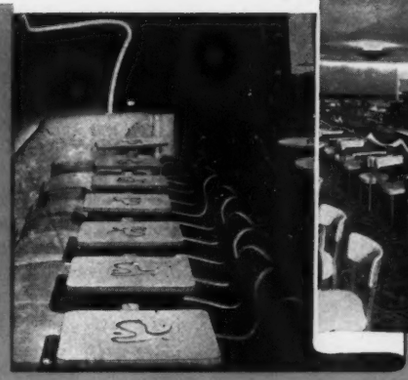


BATHROOM



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BAR TOPS AND PANELING

WINDOW SILLS

COFFEE SHOP COUNTERS

TOPS OF TELEPHONE TABLES

WHERE *Shall we use* FORMICA?

MOST hotel managers are familiar with the beauty, durability, ease of cleaning and lack of maintenance which makes Formica so desirable a material for important wearing surfaces about the hotel, but probably few realize how many places in the hotel have been successfully covered with it.

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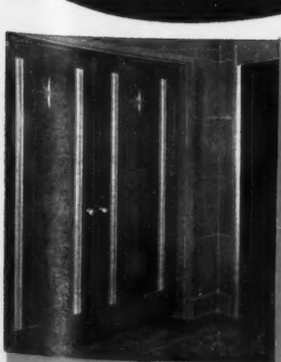
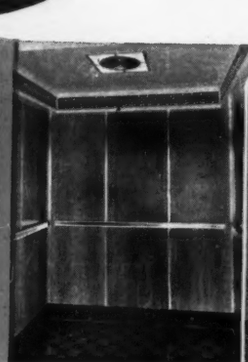
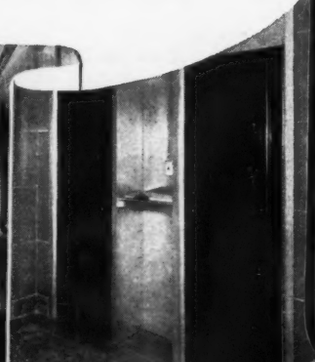
- Coat Room Shelving
- Writing Table Tops
- Registry Desk Tops and Paneling
- Lobby Paneling
- Bathroom Walls
- Restaurant Table Tops
- Column Covering
- Plates about Elevator Buttons
- Bedroom Furniture Tops
- Window Sills



FORMICA DOORS



ELEVATOR INTERIORS



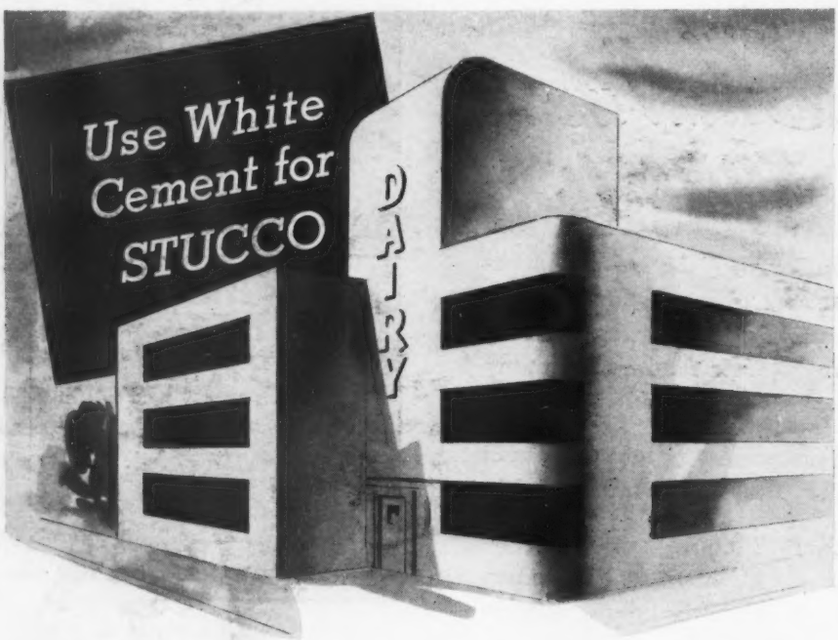
TELEPHONE BOOTHS

Reviews

(Continued from page 116)

better be invested in winning active public support. Cities with complex problems probably would obtain best results from a contest offering several fairly equal top prizes with many small but attractive awards for special solutions. In this manner (only partially adopted in either the Boston or Chicago contest) the lone mastermind and the well-coordinated team each will be encouraged to compete wholeheartedly. Such competitions should always be national (or even international) in scope to stimulate originality and to enable a stagnant area to tap the adventurous mentality and aggressive ideas current among its competitors.

RITA DAVIDSON—WILLIAM SMULL



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MEDUSA *the* ORIGINAL WHITE *portland cement*

Books

ENTER: THE HERO

When Democracy Builds, by Frank Lloyd Wright. University of Chicago Press, Chicago, 1945. 131 pp., illustrations, $4.00

Frank Lloyd Wright has been designing good buildings and writing about them for more than half a century. During a large part of that time he was pretty completely ignored (at least by his fellow countrymen) and during the remainder of the time he has been largely misunderstood. He has a right to be angry: the surprising thing about his latest book is that he is not. He emphasizes the fact that he is not writing to please anyone; he talks of the "broad, angry outlines" of the city he is picturing; he refers to himself as a radical. And yet the net impression of the book is that it is persuasive rather than disputive, descriptive rather than dogmatic.

What Wright has written here, in a recapitulation of many things he has written before, is a morality play; with the characters by this time well known and easily recognizable, as they should be in such a dramatization. He conveniently personalizes the good players and the bad players by making them proper nouns (which his publishers permitted, along with many lapses in grammar, twisted sentences, and confused punctuation). So they line up: the forces of evil—Rent, Centralization, with its stooges, Skyscraper and Traffic Problem, Survival, known also as Eclecticism or Monarchy, and Conscription—and the forces of good—Individuality, Decentralization, Democracy. The hero, Organic Architecture, steals every scene!

In the story, Organic Architecture leads the forces of good to ultimate triumph. As a dramatic effort, however, the work is weakened by a slight confusion at the climax. The method of victory is not clear. One interpretation is that The Law of Change, bolstered by "inorganic, blind forces" tears down the Vortex and clears the way for Organic Architecture. Another version contends that "vested interests cannot be divested by agreement, only by earnest Revolution." This is the only reference to that particular character.

It is tragic, in the opinion of this reporter, that Wright does not handle words as well as he does structures. He thinks clearly. His philosophy, his economics, his esthetics are of the mildly radical sort that could have a tremendous popular appeal in the present stage of our development as a nation. As an architect, in the full sense, he is the outstanding figure of either the nineteenth or the twentieth centuries. One feels that his plea for an individualism not rugged might be the

(Continued on page 120)

BROTHER... you can't buy it this way!

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Lay your plans for *correct* air conditioning, and make sure your investment will repay you—dollar for dollar—with the "remedy" you expect. By *correct* air conditioning Westinghouse means the scientific blending of correct temperature, humidity, circulation, ventilation and air cleanliness.

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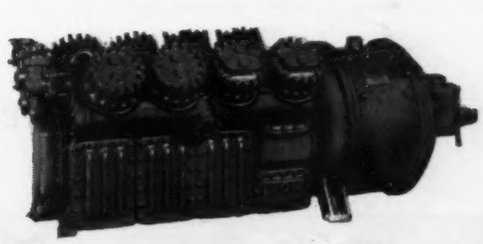

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Reviews

(Continued from page 118)

best fusion of personal dignity and group achievement yet called for. Certainly his conception of a democracy as "an integrated society of small units of high quality and genuine individuality" is a good starting point, and the Broadacre City is a stimulating goal at which to shoot. He could have been—he still could be—a figure with great popular influence on the right side of the fence—in the tradition of Tom Payne or Walt Whitman. Instead of which, as of which, as of August, 1945, he is an isolated genius with limited influence even in his own profession.

What is tragic is this: if Broadacre City is to be built, it will be built because a great many people demanded it, being dissatisfied with the city Bedlam. People of the sort that Wright calls picturesquely if anachronistically "the hewers of wood and the drawers of water." Built any other way it would be doomed to the same failure that was the fate of those other Utopias he describes as "harmless, even beautiful dreams that still come and go like glowing fireflies in July meadows." To accomplish his aim and preserve the democracy he loves there must be complete education and explanation. Right now a great many people *like* the present overcrowded city, and they would be aghast at the idea of controlling their own title-free acres. Frank Lloyd Wright, I fear, will never lead them, teach them, or even gain their full attention by telling them that they have "traded the Book of Creation for emasculation by way of the Substitute."

Of course it is not fair to criticize a man's book because it is not another book that the reviewer would rather see. There are many good things in this particular book to cheer about. No one else has Wright's fervor or clarity in pointing the finger at eclecticism; it is at best, he says, "an appreciative exploitation." Or in defining architecture: "'Planning' is now a matter of the right kind of building in the right way for the right people." He invests the architect with new dignity, and contends, with good reasons, that Organic Architecture can become the integrating force in our civilization.

The most controversial aspect of Wright's book is his insistence on brushing aside part solutions, tentative advances, temporary expedients. For example, low-cost multiple housing means to him only that "the slum quarter has become an authorized state of mind, standardization of the Soul. . . . Poverty is getting national recognition as such—as a decent *Institution!*" And this: "'Full employment' does in fact cast the same Shadow-of-Doubt on the man's economic life that is now inevitably cast upon his Patriotism by military Conscription." Small fellowship there for the individuals and organizations that are working hard for day-to-day improvement in the common man's lot.

Despite (or perhaps because of) all of the asides put in purposely, one suspects, to annoy practically anyone who might read the book, it is exciting and stimulating. Certainly, everyone who claims to be an architect should read it, to gain an enlarged conception of his duties in modern society. If architects as a group saw themselves as planners in the full sense that Wright defines planning, the profession would in time assume *its* proper importance in the continued building of a democratic America, even if they didn't want to call it Usonia.

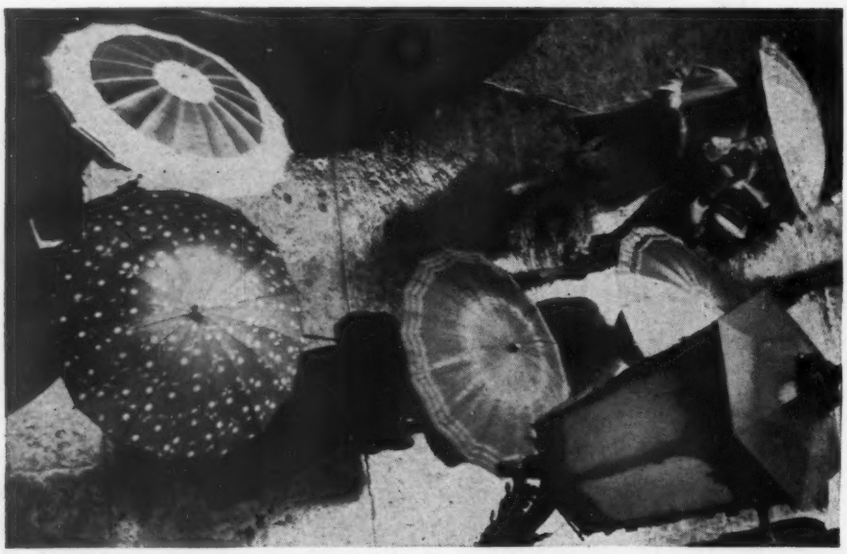
THOMAS H. CREIGHTON

TWO MAKE-AND-DO BOOKS

Masks. by W. T. Benda. Introduction by Frank Crowninshield. Published by Watson-Guptill Publications, Inc., 330 West 42nd Street, New York 18, N. Y. 1945. 148 pp., illustrated. $5.00.

Oil Paintings for the Beginner. by Frederick Taubes. Published by Wat-

(Continued on page 122)



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Reviews

(Continued from page 120)

son-Guptill Publications, Inc., 330 West 42nd Street, New York 18, N. Y. 1945. 148 pp. $6.00.

Two more books on how-I-do-it, otherwise known to editors as the make-and-do variety of publications are erroneously advertised as "Art Books." *Masks*, by Benda, is a long-overdue description of an art form extremely popular in the theater twenty years ago. And a commonly shared enthusiasm, for some time after, among readers of smart magazines and young folk stimulated by the possibilities inherent in "making faces" as a professional calling. Wladyslaw Theodore Benda came from a theatrical family; had a precocious talent for fashioning toys and other objects from paper; developed a keen cartoonist's talent for exaggeration of features to portray character, type, or emotion. He did what he was meant to do: combined his talents, and his infinite patience and perfectionist craftsmanship, into one endeavor which became his life's work (along with a certain amount of magazine illustrating).

In this well illustrated publication, Benda first reveals the dazzling aspects of mask-making as he does it, then describes his methods of procedure. The book is a remarkable document in that it reveals how close the author came, by his very perseverance and beautiful workmanship, to persuading the theater of this sophisticated age to adopt a form of pantomime originated by primitive peoples as a bogey-chaser, rain-getter, or foe-frightener. The book is a beautiful oddity, extremely interesting. As a guide to young craftsmen, however, it will fail by 90 percent in finding one with aptitudes sufficient to go and do likewise.

Frederic Taubes' *Oil Painting for the Beginner* follows his *Studio Secrets* and *The Technique of Oil Painting*, earlier publications. This succession may seem backwards, except that practically speaking, it works out better for sales. Taubes' "technique" was of such complicated nature that rank amateurs were dazzled into a state of awe and respect for the author's great wisdom by his extraordinary descriptions of the preparation necessary for canvas, ground colors, layers and layers of make-ready, days and days of setting, fixing, etc., required to become an artist of his stature. *Studio Secrets* was one step more advanced. To follow these prestige-establishers with so sweet and simple a title as *Oil Painting for the Beginner* is certain to attract the eager souls of artistic bent who still want to know how to make a painting.

(Continued on page 128)

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WHETHER it's a home to be heated—or a skyscraper to be cooled—you'll find the equipment you want in G.E.'s complete line. Equipment that has been developed by the most highly developed engineering skill . . . yet is *competitively priced.*

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Reviews

(Continued from page 122)

Unfortunately, Mr. Taubes is more afraid of losing his prowess as a man of infinite education and extensive experience than he is of writing himself out of books. No bride trying to follow grandma's rule for a Lady Baltimore cake as her first attempt at cooking will have hysterics any quicker than an amateur trying to make a picture with his nose in Taubes' book. Contradictions run rampant among his directions, furthermore. Folks with talent will make a better painting without doing *any* of the things prescribed; those with none may make a picture—but will it be art? Mr. Taubes doesn't mention the horrid word nor does he take into consideration for one moment any aspect of painting other than the mechanical procedure of putting paint to canvas: in as laborious a fashion as possible.

MAUDE KEMPER RILEY

UNPREDICTABLE ESTHETICS

From the "never, never" land of architectural design, stripped of all that makes it interesting to the architect and twisted in an arbitrary exercise in unpredictable esthetics, come *Cobblestone Architecture*, by Carl F. Schmidt (1944, 52 pp. and illustrations) and *The Small Home of Tomorrow*, by Paul R. Williams, Hollywood (Murray and Gee, Inc., 1945, 95 pp., $3.00. Sketches and illustrations).

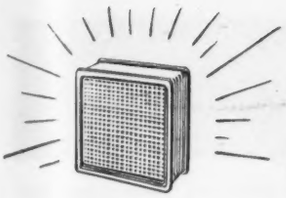
Mr. Schmidt's volume, containing measured drawings and some details of stone houses in upstate New York, may be of interest to the field-stone fireplace enthusiasts. The masons, during the period when these houses were built, experimented with many techniques of stonework—and the record of their variety is interesting. If this book wins wide circulation, we may anticipate some spots of herringbone-patterned stonework for "texture and interest" sprinkled through the magazines.

The volume on small homes is a potpourri of architectural plans and perspectives of the type with which home magazines have been plaguing architects for ages. At first glance, this collection seems better than the rest—cleaner elevations, inclusion of some imaginative designs, and some consideration for living—but it does not even attempt to educate readers to really good, practical design.

SPECIFICATIONS FOR LAYMEN

How different is *Building and Buying a House*, by B. K. Johnstone and Asso-

(Continued on page 130)



SOLVED—AT LAST?

The daylighting problem in office buildings

Night view of the Sperry Gyroscope Company's three-story administration building, designed by Nembhard N. Culin. This photograph shows dramatically how clear glass and prismatic glass block have been combined to distribute daylight and prevent glare.

Read what the editors of Architectural Forum say—

"LIGHT entering a window high above ground tends to produce glare because of the contrast between sky and interior walls . . .

". . . but people do want to see out of tall buildings. Clear glass is needed for at least a narrow vision panel extending from column to column, and from a reasonable sill-height to somewhat above eye-level.

"Clear glass above this point is a source of glare. Instead prismatic glass might be used to redirect the light and substantially improve illumination.

"The new Sperry Gyroscope Company's administration building attacks this question with peculiar insight. A frankly horizontal design, it uses prismatic glass block above a continuous panel.

". . . its functional approach to window treatment is eminently suitable to higher buildings and points the way toward a less superficial solution to a fundamental architectural problem."

* * *

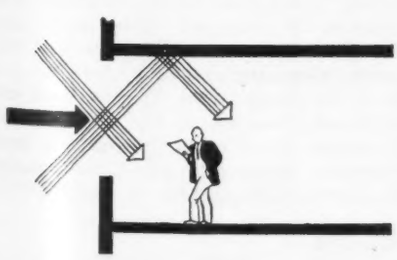
This is a new solution of window treatment—a step forward in the right direction. Insulux supplied prismatic glass block for the new Sperry Gyroscope Company's administration building.

For technical data, specifications, and installation details, see our section in Sweet's Architectural Catalog, or write: Insulux Products Division, Dept. B-45, Owens-Illinois Glass Company, Toledo, Ohio.

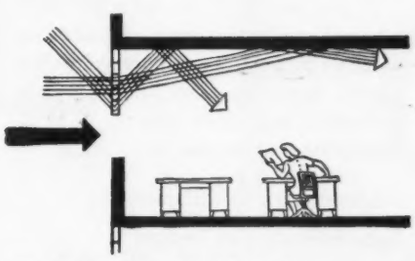
OWENS-ILLINOIS

INSULUX

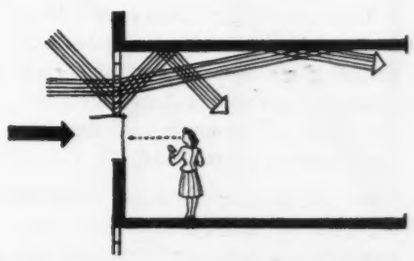
GLASS BLOCK



"Through ordinary windows, light entering from above is wasted except near outer wall. In high buildings light also enters horizontally, producing glare."



"Use of prismatic glass block above a narrow vision panel reduces glare from horizontal light, bending it upward to provide illumination deeper in room. Down-slanted light is also redirected."



"With this scheme, a flexible curtain gives occupant choice of enjoying view or eliminating glare. Horizontal hood at top of panel shuts out direct rays of sun—is important on southern exposures."

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To take high quality broadcast equipment out of the laboratory and make it economically practicable for any broadcasting station . . .

To meet the individual requirements of some of the great airlines with specially engineered communication equipment, including the ingenious Collins Autotune.

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Address E. H. Reinschmidt,
Superintendent of Design,
Collins Radio Company,
Cedar Rapids, Iowa.

Reviews

(Continued from page 128)

ciates (Whittlesey House, McGraw-Hill, New York, 1945. 155 pp., $2.75. Illustrated with sketches and diagrams). No "artist's conception"—just words! In a sense, this is a layman's version of specifications. Standards of construction and design are discussed in factual terms which, if followed, could lead the client into a well-designed contemporary home, provided he found an architect equally enlightened. The five contributing faculty members of the Pennsylvania State College of Architecture are to be congratulated on a readable text for the architect's potential client.

RITA DAVIDSON—WILLIAM SMULL

Periodicals

Reviewed by Maude Kemper Riley

ARTS AND ARCHITECTURE
3305 Wilshire Blvd.,
Los Angeles, Calif.

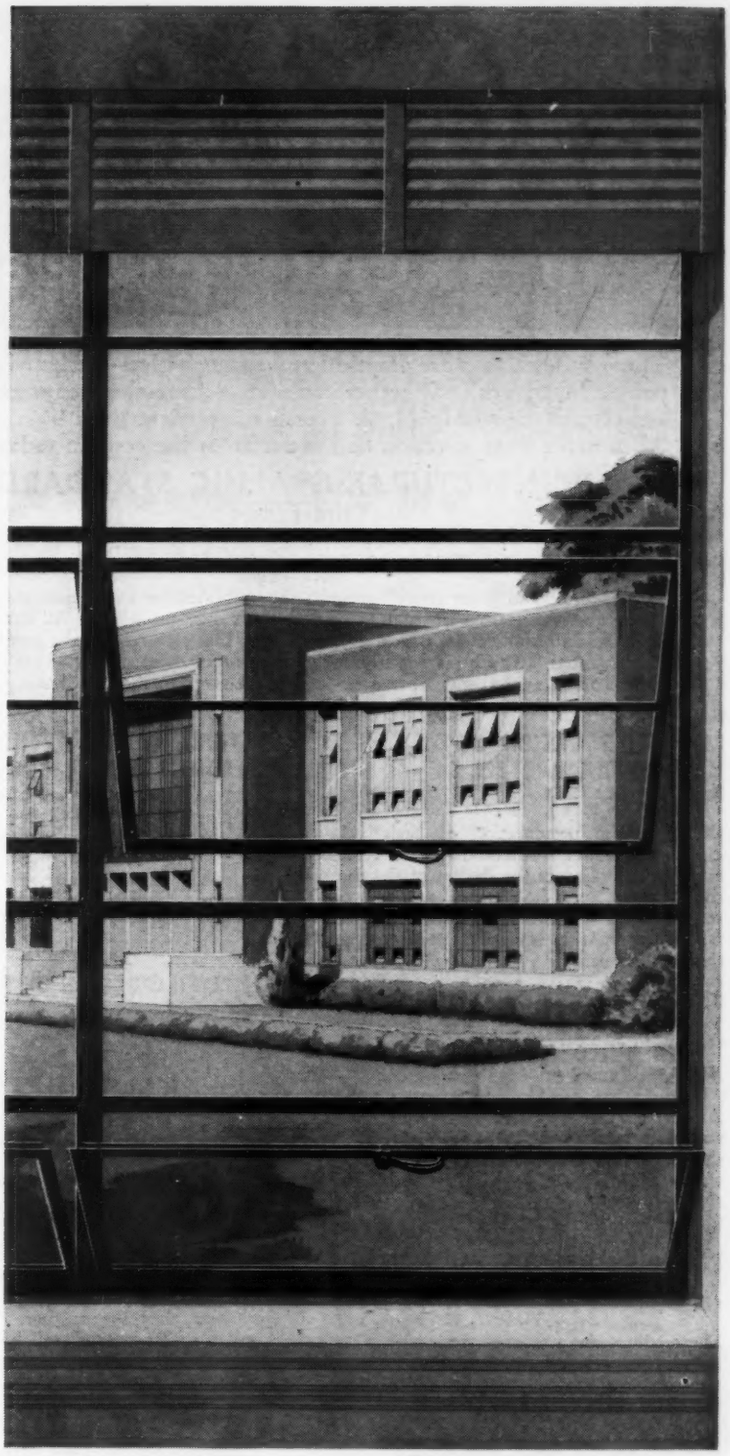
April 1945

Arts and Architecture is publishing a series of studies of houses, some of which it intends to construct when the materials are available and building restrictions lifted. Case Study House No. 2, the design of Sumner Spaulding, F.A.I.A., is for a family of four who dwell near snow-covered mountains, are without servants, but own a car and value the open air. The house splays out to a wide front from a narrow back, the rear yard being partially covered for protected passage to garage, and the rear patio being partially uncovered for airy dining. Sliding glass-screen walls adjust room temperatures in various weathers. Bedrooms are to the front, their separable sunning sections being in line with the living room terrace, their sliding glass walls set back far enough under the 11'-6" ceiling height to be shaded from direct sun rays. If desired, half of the living space may be thrown into one interesting L-shaped "free space" for family maneuverability, one of the most charming modern designs put forth in recent times. Specifications are given at great length and the magazine promises exact costs to consumer and complete specifications and trade names to be published at time of erection.

May 1945

A boxed notice of about 400 words, appearing on page 42 of this issue: "Harwell Hamilton Harris House for Sale," describes one of several forward-

(Continued on page 132)



Oakton Elementary School, Fairfax County, Virginia. Division of School Buildings, State Dept. of Education, Architect. E. E. Lyons, General Contractor, Vienna, Va.

Schools . . . For cheerful, pleasant classrooms, with abundant day-lighting and easily controlled, natural draft-free ventilation, specify Lupton Metal Windows. Simple in design; rugged in construction; weathertight. The result of more than forty years experience.

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ARCHITECTURAL GRAPHIC STANDARDS
Third Edition

By Charles G. Ramsey and Harold R. Sleeper
(1941) 344 Pages $6.00
This architectural "best seller" presents the authoritative and convenient answer to the questions raised in solving the architect's daily problems. All data, standards, and information are shown graphically, so that pictures tell the story clearly. The essential facts are given without excessive detail or ornament. This book has proved itself an indispensable time- and effort-saver to the draftsman, architect, and engineer.

SIMPLIFIED DESIGN OF STRUCTURAL STEEL
By HARRY PARKER
(1945) 226 Pages Flexible Binding $2.75
Clear, concise presentation of basic principles and modern methods of structural engineering. Covers the design of the most common structural steel members that occur in building construction. All necessary tables. Illustrative examples, problems and their solutions.

SIMPLIFIED DESIGN OF ROOF TRUSSES FOR ARCHITECTS AND BUILDERS
By HARRY PARKER
(1941) 195 Pages $2.75
A compact, thorough treatment of the essential principles and methods behind the design of the most common types of roof trusses. Comprehensive enough for the practicing architect or builder . . . simple enough for the beginner.

PLUMBING PRACTICE AND DESIGN
By SVEND PLUM
(1943) VOL. I, 315 Pages, $4.50
VOL. II, 329 Pages, $4.50
These volumes represent a complete working library on plumbing. They offer the essential, modern data on plumbing in handy reference form.

ARCHITECTS' AND BUILDERS' HANDBOOK
By FRANK E. KIDDER and HARRY PARKER
(1931) Eighteenth Edition, 2315 Pages, $8.00
Contains information on every subject likely to come up for consideration by architects and builders.

MATERIALS AND METHODS OF ARCHITECTURAL CONSTRUCTION
By CHARLES M. GAY and HARRY PARKER
(1943) Second Edition, 636 Pages $6.00
Now revised, this book gives the modern uses of pressed wood, plastics, and structural glass, as well as recent tables on the strength of materials and properties of structural steel.

SIMPLIFIED DESIGN OF REINFORCED CONCRETE
By HARRY PARKER
(1943) 249 Pages $2.75
Contains simple, succinct explanations of all the usual reinforced concrete members in buildings. Gives all necessary tables.

STANDARD PLUMBING DETAILS
By LOUIS J. DAY
(1938) 119 Plates $6.00
Covers every phase of plumbing graphically, with no text description. The drawing tells the whole story—installation, connections, and how they fit together. This valuable book presents sound, reliable information covering best modern practice.

SIMPLIFIED ENGINEERING FOR ARCHITECTS AND BUILDERS
By HARRY PARKER
(1938) 214 Pages $2.75
A practical book containing the important basic principles employed in the design of structural members in buildings. Features practical problems with their solutions.

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Reviews

(Continued from page 130)

looking houses by California architects, shown in model by the Museum of Modern Art in New York City. The redwood and glass house itself, it seems, is three years old; was built atop Mt. Washington, and commands a view from its living room of the San Fernando Valley, Elysian and Griffith Parks, Los Feliz Hills, Hollywood and Beverly Hills, and also the Pacific Ocean. The house, the view, the furnishings, are up for sale. Owner will show by appointment—no sightseers, please! The house has a 39′ x 18′ living room, larder, laundry, modern heating, three terraces, 2-car garage, parking space for a dozen cars, badminton court, etc., etc., etc. For sale are especially designed furniture, lamps (done by architect H. H. Harris and Kem Weber), the floor coverings, drapes, divan cushions, chairs, dining room suite, game tables—"excepting personal effects, grand piano, refrigerator, dachshund and Siamese cat."

Here, in New York, we who are still gaping at the new-style glass front models presently shown by the Museum in collaboration with *The Ladies Home Journal*, are made by this notice to feel as if we'd skipped to the end of the book, after reading an exciting first chapter, and found it was just the same old story. Or as if tomorrow had suddenly become a year before last before last.

An amplification of the above-mentioned Sumner Spaulding house for a family of four, showing a model and a number of sketches of the interior, its furnishings and its "action," is given in this issue. The design grows even more interesting. Its flexibility is remarkable for its practicability.

INTERIORS
11 East 44th St.,
New York, N. Y.

May 1945

The editors of *Interiors* remembered the twentieth anniversary of the International Exposition of Decorative Arts held in Paris in May, 1925. One of the editors who was there remembers also that American designers were not asked to the party (there were twenty nations making their *art moderne* debut) but that they crashed it in great numbers. It was there that the "drooping tulip" light fixture, ant-and-beetle wallpaper, fringed lamps, and brocaded fabrics went out—replaced by carved friezes, marble and "sanitary" baths, ivory inlay in furniture, etched and frosted glass. The right bank of the

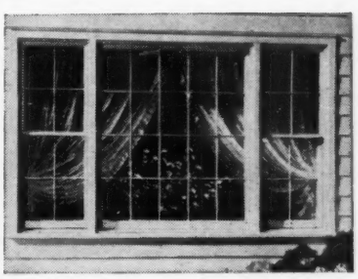
(Continued on page 134)

You'll Find All the Answers in Curtis Silentite...

● Just *one or two* good features in a window won't be enough for post-war America! Window-conscious home builders will look for windows that satisfy *completely*—on every count. Windows that are weathertight *and* easy to operate. Windows easily installed in any size or type of home and easy on the budget, too. Windows that combine the beauty of streamlined design with low maintenance cost through the years.

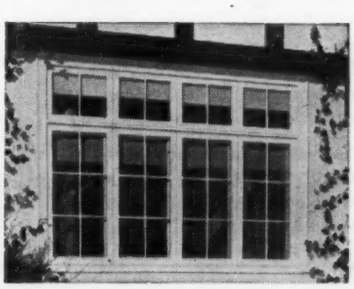
Curtis will have *all* these answers in the famous Silentite window line. For Silentite windows are products of 79 years' experience and scientific research . . . research constantly carried on through the war years. Because Curtis *knows* window production—because Silentite windows represent outstanding improvements in window construction, you can be sure that Curtis will amply meet every post-war need and plan. For complete information on Silentite windows and on Curtis Stock Architectural woodwork—mail the coupon!

A pleasingly modern note is struck by these corner windows, made up of Curtis Silentite double-hung units. Curtis offers you a wide variety of sash styles for any kind of plan.



The slender muntins add a feeling of lightness and grace to this Curtis "picture" window. Several combinations of such fixed-sash units will be available for your choice.

Bay windows create a special character for many a home . . . and are a means of adding extra space, as well. Bays made up of Curtis stock units are moderate in cost, easy to install, easy to operate.



Casement groups such as this are practical from a fuel-saving standpoint when you specify Silentite Casements. For the Silentite Casement is especially designed for weather-tightness.

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Reviews

(Continued from page 132)

Seine gave Americans something to think about besides *quenelles de brochet Lyonnaise*, served on the *Quais* by dress-designer Paul Poiret. They learned what modern design was—although it was still a commodity to market only among the rich. What was missing—besides suitability to living needs and accessibility to society in general—was the understanding we have today of proportion, line, and overall design in architecture, furniture, interior design, and city planning. (And, it might be added, the consideration of climate and living customs, now so much more intelligently taken into account.)

Interiors goes on, in one of its most entertaining issues, to consider the question of display and what is being done today in this all-important sales promotion field. In ladies' apparel and accessories, biggest buying is done in wholesale show rooms where the manufacturer must not only hint at the extent of his own good taste by surrounding his product with a handsome décor, but also must hint to the retailer how he, in turn, can best present the goods. Architects Vinicio Paladini and Leon Barmache gave a circular showroom, semi-private huddle booths, indirect daylight, and fluorescent cove lighting to the New York showroom of Mack Sepler, manufacturer of women's slacks, skirts, and sports wear. They made it dazzling with elegant double doors, corrugated glass screens, gold and white Marbalia walls; considered ease of customer and model traffic flow.

June 1945

Owners of homes that harbor children of dirty-fingers age, or bigger ones who enjoy water fights or jam free-for-alls, may take heart that the home of tomorrow needn't deter such outbursts of juvenile expression—may even encourage the water fights as desirable. *Interiors* reports that Monsanto Chemical Company has developed a plastic-coated wall covering, cleanable with water spray. Nothing is said of run-off gutters around the living room.

A combination office and pleasure retreat was designed by the unconventional Bernard Rudofsky for wrought-iron-furniture-man John B. Salterini, owner of an enormous New York City loft. Windows were stretched up, others created in the roof of these high-ceilinged quarters, glass partitions made to divide the extensive space into Hospitality Room, Solarium, Conservatory, kitchen, and dormitorio (behind an invisible door). Airy and spacious offices

(Continued on page 136)

SPECIFICATIONS FOR *Clean, Comfortable Homes*

PLAN those postwar homes for cleaner, more comfortable living by the elimination of greasy, grimy cooking vapors, stale tobacco smoke and liquor fumes.

Blo-Fan

"SPOT" VENTILATORS

get rid of this unwanted air *at the source*—before it spreads and leaves its deposit of grease on drapes and furniture. Blo-Fans are *installed in the ceiling*, directly over the origin of steam or smoke. Combining the principles of both breeze fan and blower, the Blo-Fan is twice as effective as an ordinary sidewall fan of equal size across the room. The Blo-Fan scoops up and whisks away the vapors as they rise.

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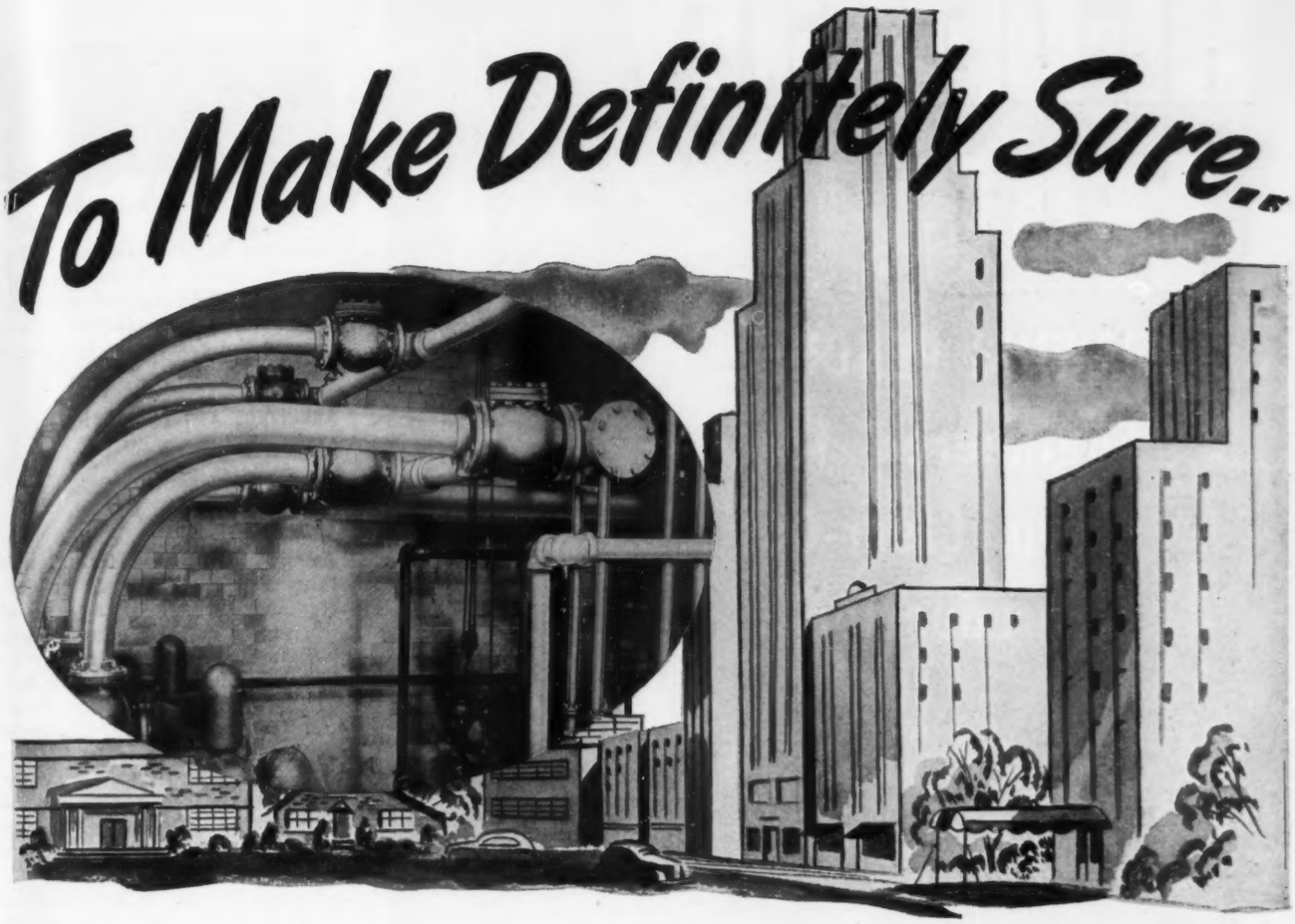

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The EBERHARD FABER Drawing Pencil in 18 degrees, 7B to 9H plus 6 degrees with Chisel Point Leads

Reviews

(Continued from page 1

complete the loft retreat. The the is sun, space, informality, and hos tality, all of which add up in this s tion to attractive quarters in which around the clock may be lived with a hitch.

ARCHITECT AND ENGINEER
68 Post St.,
San Francisco, California

March 1945

Architect William Arthur Newman f ther discusses opportunities for arc tect and engineer in the cities of M ico. As an example of recent gala-st building, he cites the 12-story Alam Hotel in Mexico City, being built a cost of five million dollars. It will c tain 550 rooms, shops, theater, conv tion hall, ballroom, cabarets, din rooms large and small, a marble lo with two grand staircases. The A meda will be the center of commun life. There is parking space to acc modate 400 cars. The architect, Ca Obregon Santacilia, is president of Society of Mexican Architects and been given many major commissi among them the impressive *Monum of the Revolution*, built over a s building construction begun and ab doned with a change of governm Mr. Newman's description of primi day labor used in such construction by way of warning off both temp mental designers and "efficient" Am can builders, who could not con Mexico's right to move dirt from a excavation by lines of peons carr one-hundred-pound baskets hung their backs from headbands. But b ing plans for Mexico are extensive while the Mexican looks askance at exploiting capitalist, he values the fessional man, even the foreigner.

JOURNAL OF THE ROYAL ARCHITECTU INSTITUTE OF CANADA
57 Queen Street West, Toronto 1, Canada

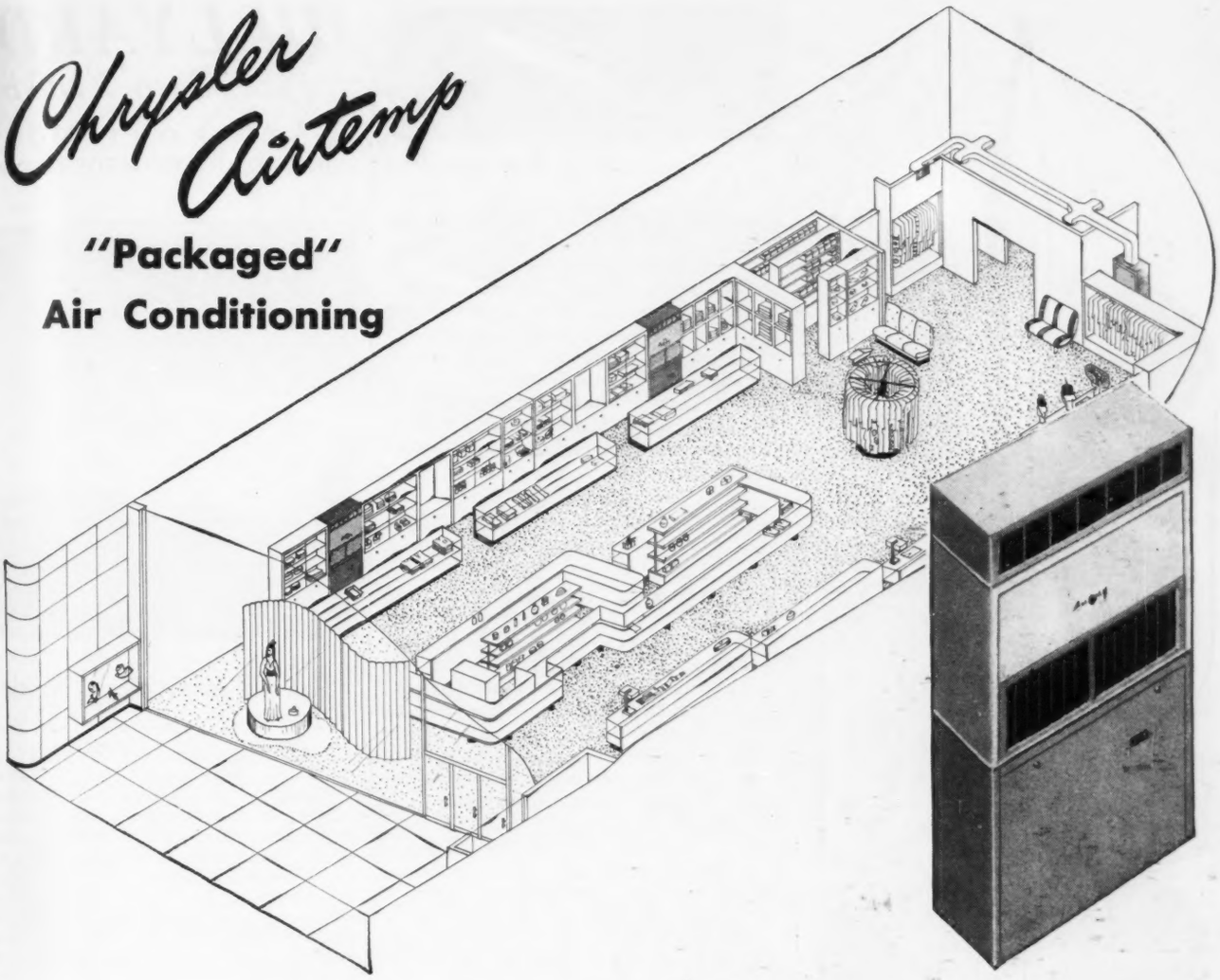
March 1945

Forsey Page, president of the R.A. reports in this issue on the 38th An Meeting of the Institute, held in Tor in February. His Report of the Cou includes such interesting statistics the fact that only three architects Canada at that time were empl outside the profession; that, of member architects, little over a th are employed at all; of the empl 131 are in some level of governmen are with corporations, only 25 are ployed by architects in private pra The figures were obtained from

(Continued on page

Chrysler Airtemp

"Packaged"
Air Conditioning



Comfort Increases Profits In Ladies' Specialty Shops

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Reviews

(Continued from page 136)

tionnaires, and are not complete. It has been proposed, postwar, to permit professional personnel to set up their own bargaining agencies. The Government is considering this. Canada's housing shortage, resulting from the depression years of the 1930's and five years of wartime restrictions, Page said, is bad; the condition of old houses, worse. Only 14% of rural homes are equipped with furnaces, 7% with baths, and 20% with electricity.

In an article by E. G. Faludi and Catherine Chard on *The Prefabricated House Industry*, comparison is made of English and American systems. An English manufacturer, who for a long time has constructed sections of steel frames when erecting large industrial buildings, is quoted as avoiding the word "prefabrication" in describing his building method because it has come to suggest impermanence or makeshift. Trouble is, the English Government is concerned with emergency housing problems; English industrialists want permanent structures. In the United States, speed, and ease of handling and assembling sectional structures for housing war workers have affected strongly the American view of prefabrication, made architects here blind to its usefulness as simply a process of producing building materials.

May 1945

A special number presents the problem of finding the right Master Plan for the City of Montreal. The report here published was issued by the Department of City Planning, under Aimé Cousineau. Montreal is nearly two-fifths city-owned. In fifty years, it has grown from an area of 10 square miles to 50 square miles. This plan takes into consideration 177 square miles—one-fourth of which are actually occupied by the City and represent one million inhabitants, or 80 percent of the population of this area. Main shortage appears to be in the low-rental dwellings.

THE ARCHITECTURAL REVIEW
45 The Avenue, Cheam, Surrey, England

June 1945

Introducing London as a conglomerate city, and a dearly beloved one for a' that, the *Architectural Review* puts into this issue its very *all*, in a plea for a suitable solution for the city's rebuilding in a manner neither monumental, nor Hausmann, nor Beaux-Arts. In a three-part attack on the subject, it is first stated what England (therefore

(Continued on page 140)

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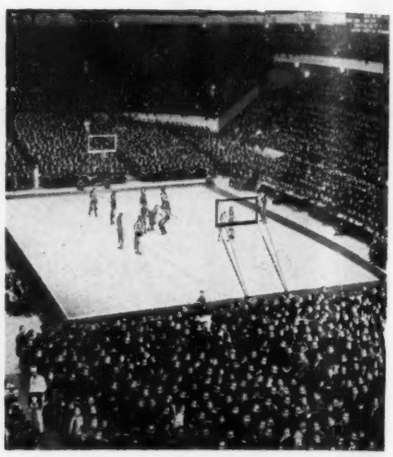

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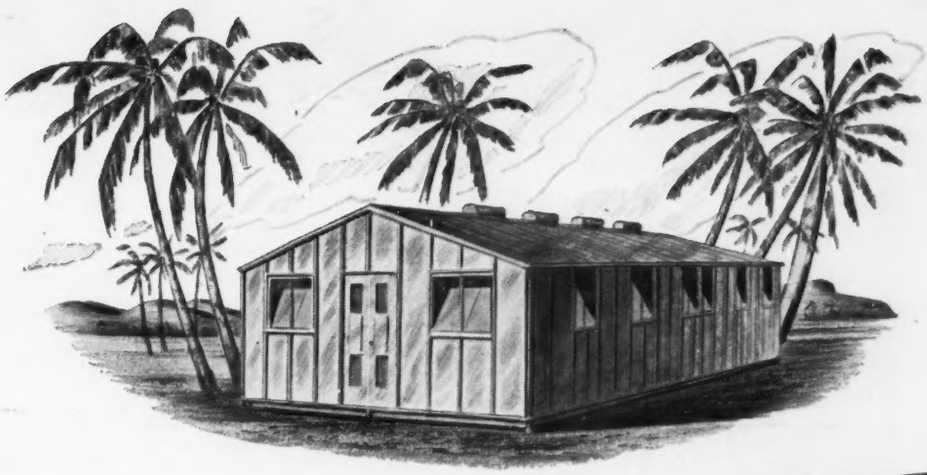

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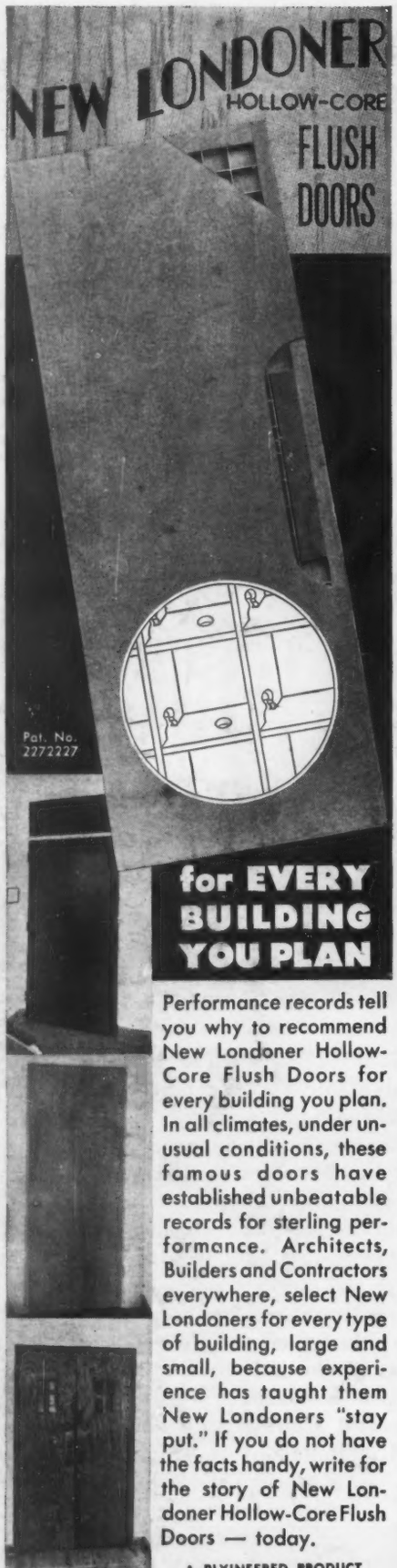

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Reviews

(Continued from page 138)

London, therefore The City) really *is*. For example, a caption, "Conglomerate, it is the nature of London to be," is followed up in text by such randomly gleaned statements as:

"The English dislike the formal, have a general bias towards informality in public and private life.

"In this urban jungle, visual gems are scattered about with the casualness of the prolific artist who knows he can produce such stuff, and better, any day.

"London bears the scars, the thousand indignities and the marks of character, that come with a long, eventful life.

"The argument for a non-monumental London, for a picturesque London, for a London that is not merely accidentally picturesque, but overtly so, is forced on the planner the minute he appeals to history.

"Paris has hypnotized the planning professionals for something like a century. "Picturesque is not merely a friend of functional, it is a very, very close relative."

After principles of planning for England and London are established, in the Second Part they are applied to the City; and in the Third Part, discussion and study narrow upon St. Paul's Cathedral and its precinct. Informality is recommended, and a plan creating heights in variety—so that vistas of St. Paul's will occur, as it were, accidentally, from all parts of the environmental sections.

"London can be developed with all the old spontaneous variety of incident characteristic of the genius of the place."

An architect's sketches of oblique spaces between buildings, of multi-focal effects where green spaces between office blocks give glimpses of the dome of St. Paul's, illustrate the crux of the proposed plan. It is advocated that planners capitalize all along the way on "the drama of the unexpected view" which bombed London now affords strollers. Touchingly illustrated, this issue begins with Wenceslas Hollar's "View of London Bridge" for front cover—an etching made twenty years before the London fire of 1667. Hogarth, Cruikshank, Gustav Doré, and anonymous artists of the pen and engraver's burin furnish a pictorial anthology of the life of London. Photographs made before and after the bombings of London are mainly odd shots of oddly and inordinately beautiful spots in the great city.

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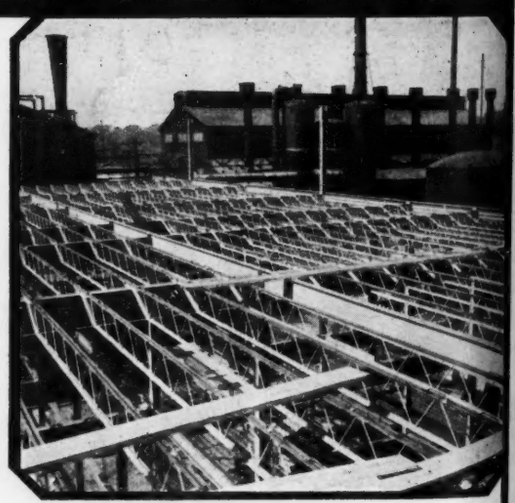

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